UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 2
290 BROADWAY
NEW YORK, NY 10007-1866

MAY 1 1995

EXPRESS MAIL

Braulio Garcia Jimenez, Esq.
GOLDMAN ANTONETTTI & CORDOVA
American International Plaza
Fourteenth Floor
250 Munoz Rivera Avenue
Hato Rey, Puerto Rico 00918

Re: Caribbean Petroleum Corporation
Administrative Order on Consent
Docket No. II RCRA-95-3008(h)-0303

Dear Mr. Garcia:

Enclosed please find a signed Section 3008(h) Order for the Caribbean Petroleum Corporation.

Sincerely,

Amy R. Chester
Assistant Regional Counsel
Air, Waste & Toxic Substances Branch
Hazardous Waste Section

Enclosure

SMT. June 11, 2008

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bcc w/enc.: Barry Tornick
Cliff Ng
William K. Sawyer

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION II

IN THE MATTER OF:	&	
CARIBBEAN PETROLEUM, CORPORATION	&	ADMINISTRATIVE ORDER ON CONSENT
BAYAMON, PUERTO RICO	&	
EPA I.D. No. PRD000632182	&	DOCKET No. II RCRA-95-3008(h)-0303
RESPONDENT	&	Proceeding under Section 3008(h) of the Resource Conservation and Recovery Act, as amended.

I. Preliminary Statement

1. This Administrative Order on Consent ("Order") is being issued to Caribbean Petroleum Corporation ("CPC" or "Respondent"), pursuant to the Resource Conservation and Recovery Act of 1976 ("RCRA"), as amended by the Hazardous and Solid Waste Amendments of 1984 ("HSWA"), codified at 42 U.S.C. § 6901 et seq. ("the Act").

2. Section 3008(h) of the Act, 42 U.S.C. § 6928(h), authorizes the Administrator of the United States Environmental Protection Agency ("EPA") to issue an order requiring corrective action, or such other response which she deems necessary to protect human health or the environment, if, on the basis of any information, she determines that there is or has been a release of hazardous waste or hazardous constituents into the environment from a facility that is or was authorized to operate under Section 3005(e) of the Act, 42 U.S.C. § 6925(e). The authority vested in the Administrator has been delegated to the Regional Administrator by EPA Delegation Number 8-31, dated April 16, 1985. This authority has been further delegated by the Regional Administrator of EPA, Region II, to the Director of the Air and Waste Management Division of EPA, Region II, by Region II Delegation Number 8-32, effective July 1, 1987.

3. This Consent Order is issued by the Director of the Air and Waste Management Division, EPA Region II, pursuant to Section 3008(h) of RCRA, 42 U.S.C. § 6928(h).

4. To effectuate the mutual objectives of EPA and Respondent, the Respondent agrees to undertake all actions required by the terms and conditions of this Consent Order, and consents to and will not contest the terms of this Order. Except as otherwise specifically provided for in this Consent Order, neither failure to contest this Order, nor Respondent's actions in complying with the terms of this Order, shall be construed as an admission of any fact(s) or law contained in this Order.

II. Parties Bound

1. For the purposes of this Consent Order, the term "Parties" shall be defined as the United States Environmental Protection Agency, Region II and Caribbean Petroleum Corporation located in Bayamon, Puerto Rico.

2. This Order, and the responsibilities and obligations it imposes, shall apply to and bind the Respondent, its present and future officers, directors, officials, agents, servants, trustees, receivers, successors, and/or assigns, as well as all other persons including, but not limited to, firms, corporations, subsidiaries, contractors, independent contractors, subcontractors, or consultants who act for, are owned by, or are in an agency relationship with the Respondent, and/or who conduct, monitor or perform any work pursuant to or required by this Order.

3. Regardless of Respondent's employ of, contractual agreement and/or relationship with, any entity named in paragraph 2 of this section, the Respondent remains ultimately liable for failure to carry out, or comply with, any term or condition imposed by this Order.

4. All contractual agreements entered into by Respondent aimed at satisfying its responsibilities or obligations under this Order shall strictly comply with the terms and conditions of this Order. In addition, Respondent shall, within one week of the effective date of this Order and/or immediately, upon hiring, provide a copy of this Order, and any relevant attachments, to all contractors, subcontractors, laboratories, consultants, or any entity retained to conduct, monitor or perform any work pursuant to this Order.

5. Respondent shall give notice, and a copy, of this Order to any successor in interest prior to any transfer of ownership or operation of the "facility" (as defined in Section IV.3 and 6.

below) and shall notify EPA's designated contact, in writing, of the transfer thirty (30) days prior to any such transfer.

6. No change in the Respondent's corporate form or in the ownership of the facility or its assets shall in any way alter or alleviate Respondent's responsibility and obligation to carry out all the terms and conditions of this Order.

III. Statement of Purpose

This Order is being issued to protect human health and the environment from releases of "hazardous waste" and/or "hazardous constituents", as defined by Section 1004(5) of the Act, 42 U.S.C. § 6903(5), 40 C.F.R. §§ 260.10, 261.3, and/or 40 C.F.R. Part 261 Appendix VIII, at or from Respondent's Facility. The Order requires, at a minimum, the performance by Respondent of Interim Measures, a RCRA Facility Investigation ("RFI") to determine fully the nature and extent of any release(s) of hazardous waste and/or hazardous constituents from the facility into the environment, and to gather necessary data to support the Corrective Measures Study, if one is deemed necessary, pursuant to this Order.

If EPA determines that corrective measures, in addition to Interim Measures to be implemented at the facility, are necessary, the Respondent shall conduct a Corrective Measures Study ("CMS") to develop and evaluate one or more corrective measure alternatives and to recommend a final corrective measure or measures. This Order does not require Corrective Measures Implementation (CMI). However, if a CMI is appropriate, such measures shall be either incorporated into a post-closure permit, a new Order, or a modification of this Order.

IV. EPA's Findings of Fact

1. Respondent is a Corporation:

Respondent is Caribbean Petroleum Corporation ("CPC"), a private corporation authorized to do business in the Commonwealth of Puerto Rico.

2. Respondent is a Person:

Respondent is a "person" as defined by Section 1004(15) of the Act, 42 U.S.C. § 6903(15) and in 40 C.F.R. § 260.10.

3. Respondent is the Owner and Operator:

Respondent is the "owner and operator" of the CPC "facility" ("the facility") located on State Road #28, Km. 2, Urb. Industrial Luchetti, Bayamon, Puerto Rico, 00619, as those terms are defined in 40 C.F.R. § 260.10.

4. Notifications/Part A Permit Applications:

Pursuant to Section 3010 of the Act, 42 U.S.C. § 6930, on August 5, 1980 Respondent's predecessor notified EPA that it generates "hazardous waste," as that term is defined in Section 1004(5) of RCRA, 42 U.S.C. § 6903(5) and 40 C.F.R. § 261.3, at the facility. On November 5, 1980, Respondent's predecessor filed a Part A permit application with EPA thereby qualifying for interim status. On February 2, 1982, Respondent's predecessor requested the withdrawal of its Part A application and interim status claiming it had been a "protective filer." EPA never made a determination that Respondent's predecessor was a protective filer.

In 1989, Respondent notified EPA by letter that it was the new owner/operator of the facility. On September 24, 1990, Respondent submitted a revised Notification of Hazardous Waste Activity form notifying EPA of its hazardous waste activity, as well as a Part A permit application. In this notification, Respondent identified itself as a generator of hazardous wastes, as well as the owner and operator of a hazardous waste treatment, storage, or disposal facility (TSD). Respondent submitted the notification and Part A due to the September 25, 1989 promulgation of the Toxicity Characteristics Rule which classified waste managed in the facility's equalization basin as EPA Hazardous Waste Number D018. (The equalization basin waste, when subjected to the Toxicity Characteristic Leaching Procedures, resulted in exceedence of 0.5 mg/l for benzene). 40 C.F.R. § 261.24.

On May 1, 1991 Respondent submitted to EPA a revised Part A application due to a new hazardous waste listing for petroleum sludge that further classified the waste managed in the facility's equalization basin as EPA Hazardous Waste Number F037.

On September 25, 1991, Respondent lost interim status, pursuant to Section 3005 of RCRA, for management of hazardous waste in the equalization basin because Respondent did not adequately certify that it is in compliance with all applicable groundwater monitoring and financial assurance requirements.

5. Interim Status:

Pursuant to Section 3005(e) of the Act, 42 U.S.C. § 6925, and 40 C.F.R. §§ 270.1(b) and 270.70(a), Respondent received "interim status" with the timely submission of its:

a) Section 3010 notification; and

b) Part A of the Permit Application

Interim status facilities are subject to the regulations promulgated pursuant to Sections 3004 and 3005 of the Act, 42 U.S.C. §§ 6924 and 6925, which were codified in 40 C.F.R. Parts 260-265, 268, and 270.

6. Facility Description:

The Caribbean Petroleum Corporation (CPC) facility is a 179 acre facility located in the Luchetti Industrial Park in Bayamon, Puerto Rico. The facility, formerly called Caribbean Refining Corporation, began operation in 1955. In 1962, Gulf Oil Corporation purchased the facility and the name was changed to Caribbean Gulf Refining Corporation. Chevron Corporation purchased all the assets of Gulf Oil Corporation in 1984. In September 1987, Chevron Corporation sold all of its assets in Puerto Rico to First Oil International. The refinery was temporarily shut down in February, 1988 until the last quarter of 1989. In 1989 CPC informed the EPA that it was the new owner.

The refinery produces fuel oils, petroleum distillates, fuel gases, diesel oil, kerosene, unleaded gasoline, residual oil #5 and #6, and asphalt. Lead gasoline production ceased in 1988. Crude oil is brought to the refinery via pipeline from the dock facility located on the San Juan Bay. The crude oil is then stored in tanks on site until processing. The refining processes include two crude distillation units which process crude oil to produce unleaded gasoline, distillate, gas oil and reduced crude oil. Vacuum distillation units remove lighter materials and heavier materials are utilized to manufacture asphalt and different fuel oils. A fluid catalytic cracking unit is utilized for the production of gas, gasoline, distillate and light fuel oils. A Catalytic Reforming Unit produces high octane fuels while a Hydrotreating unit reduces the sulfur content of the distillate, which is stored and sold as diesel fuel. An Amine Treatment unit cleans refinery gases while sulfur is recovered from the resultant acid gas to be sold.

The hazardous wastes generated at the plant include DAF Float (K048), slop oil emulsion solids (K049), heat exchanger bundle cleaning sludge (K050), API Separator sludge (K051), unleaded tank bottoms (D001), spent phosphoric acid catalyst (D002), and reactive waste (D003). These hazardous waste are sent off-site for treatment and disposal. Respondent also generates wastewater treatment sludge (F038 hazardous waste) which it formerly managed in a surface impoundment, but now manages in a tank system.

The CPC facility also operates an underground recovery system that recovers both free product, which are hydrocarbons, and potentially contaminated ground water.

7. Geologic and Hydraulic Conditions:

The geology of the site consists of two general lithologic units: clay overburden and limestone. The clay overburden varies in thickness from 10 feet along the southern perimeter of the refinery to 90 feet on the northern perimeter. The clay overburden contains a shallow unconfined water-bearing zone. The limestone beneath the facility dips to the north and exhibits distinctive karst features common to the area: mogotes, small solution features, and undulatory surfaces. The limestone contains the aquifer, which is confined. The potentiometric surface of the limestone aquifer is somewhat lower than the water table and slopes toward the north.

The depth to the water in the uppermost aquifer beneath the facility ranges from approximately 2.5 to 13.5 feet below ground level. The major surface water body nearest the CPC facility is Las Lajas Creek which is channeled through a concrete conduit underground and routed along the western and northern portions of the site. This creek returns to an open channel at a point north of the refinery's wastewater treatment facilities, where the site's effluent and storm water are discharged under a NPDES permit. The creek flows northward toward San Juan Bay located approximately two miles to the north-northwest from the site.

8. Evidence of Releases:

a. Five hazardous constituents--benzene, toluene, chromium, mercury, and lead--have been detected in the ground water beneath a portion of Respondent's facility. Benzene, lead, mercury, and chromium have been detected at levels at or above the health-based levels or maximum contaminant levels ("MCLs") for these constituents. Specifically, the MCL (in ground water) for benzene is 5.0 parts per billion ("ppb"), lead is 50.0 ppb, mercury is 2.0 ppb, and chromium is 50.0 ppb. See 55 Fed. Reg. 30798, 30868 (July 27, 1990). As of the issuance of this Order, a health-based level or MCL for toluene has not been published.

The following ground water monitoring wells at the facility, indicate the presence of benzene and toluene in the ground water: MW14B, MW75B, MW76B, and MW77B. Concentrations range from 4.0 ppb to 147.0 ppb for benzene and 13.0 ppb to 56.0 ppb for toluene. The following monitoring wells indicate the presence of lead in the ground water: MW14B, MW18D, MW20B, MW21B,

MW75B, and MW77B. Concentrations range from 1.0 ppb to 50 ppb. [Reference: Assessment of Hydrocarbons in Ground Water at the CARECO Refinery, Bayamon, Puerto Rico, June 1990, prepared by Chevron.]

The ground water monitoring system installed for the Equalization Basin indicated the presence of chromium, mercury, and lead. Chromium (dissolved form) was detected in wells EB-102 (0.121 ppm), EB-103 (0.149 ppm), EB-104 (194.0 ppm), and EB-105 (124.0 ppm). Mercury was detected in well EB-102 (0.0028 ppm). Lead was detected in well EB-103 (0.125 ppm). [Reference: Quarterly Groundwater Monitoring Report for 1992 submitted by CPC.]

Free product/groundwater recovery wells in the following areas indicate the presence of hydrocarbons (which contain benzene, toluene, chromium, mercury, and/or lead):

- AOC #12 - Old Gasoline Loading Rack Area--[Well 48B]
- LPG Tank Area--[Well 52B]
- Intersection of Avenue D and 5th Street--[Well 34A]
- Intersection of Avenue D and Sixth Street--[Well 60A]
- Avenue C between 4th and 5th Streets--[Well 43B]

[Reference: Assessment of Hydrocarbons in Ground Water at the CARECO Refinery, Bayamon, Puerto Rico, June 1990, prepared by Chevron.]

b. The RCRA Facility Assessment Report dated March 1989, identified 12 solid waste management units (SWMUs) and 11 areas of concern (AOCs) with evidence of past releases of hazardous waste and/or constituents to soil. These are listed below:

- SWMU #1 - Container Storage Area
- SWMU #2 - Slop Oil Tank 1000
- SWMU #3 - Slop Oil tank 1001
- SWMU #4 - Solids Knockout Pit
- SWMU #5 - Surge Tank ET-1
- SWMU #6 - API Separator
- SWMU #7 - Corrugated Plate Interceptor
- SWMU #8 - Equalization Basin
- SWMU #9 - Inlet Basin to Biological Reactor #1
- SWMU #10 - Digester
- SWMU #13 - Slop Oil Tank 452
- SWMU #19 - Natural Aeration Basin
- AOC #1 - Crude Unit Charge Pump

- AOC #2 - Fuel oil Transfer Pump (Cummins) Area
- AOC #3 - Fuel Oil Transfer Pump Area near Tank 603
- AOC #4 - Asphalt Heater Unit
- AOC #5 - Fuel Oil Loading Rack Pump Area
- AOC #6 - Debutanizer Reboiler Area
- AOC #7 - FCC Unit Compressor Lube System Area
- AOC #8 - Heat Exchanger Bundles at Heavy Cycle Steam Generator
- AOC #9 - Crude Unit #1 Area
- AOC #10 - Crude Unit #1 near Heat Exch. Bundle Area
- AOC #11 - Fuel Oil Pipeline Spill Areas

9. SWMUs With Potential for Releases

Known SWMUS at which there is a potential for release:

- SWMU #11 - Old Oil Lagoons
- SWMU #12 - Old East Separator
- SWMU #32 - Old landfill
- SWMU #33 - Nonhazardous disposal site
- SWMU #34 - Sulfur Lagoon
- SWMU #35 - Catalytic waste pond
- SWMU #36 - Lagoon
- SWMU #37 - Sulfur Drum Storage Area
- SWMU #38 - Centrifuge
- SWMU #39 - Gravity Thickener
- SWMU #40 - Scrap Metal Yard

See Attachment I to this Order for the locations of these SWMUs and AOCs.

10. Need to Protect Human Health and Environment:

Below are some of the health effects associated with some of the hazardous constituents detected in the ground water and/or soil at Respondent's facility.

a. Benzene is toxic by inhalation, ingestion, subcutaneous, and intraperitoneal routes. It affects the central nervous system and blood system. It is a narcotic and is a human carcinogen (myeloid leukemia). It has a strong irritating effect, producing, erythema and burning, and, in more severe cases, edema and blistering. The anesthetic action of benzene consists of a preliminary stage of excitation followed by depression and, under continued expose, death through respiratory failure. [Reference: Hazardous Chemicals Desk Reference, N. Irving Sax/Richard J. Lewis, Sr., 1987.]

b. Toluene is toxic by inhalation, ingestion, and subcutaneous routes. It is a poison by intraperitoneal route and is a carcinogen. It is a skin and eye irritant and has human central nervous system and psychotropic effects. In the case of acute poisoning, the effect has been that of a narcotic, the victim passing through a stage of intoxication into one of coma. In the case of chronic poisoning, anemia and leucopenia, with a biopsy showing bone marrow hypoplasia has been reported. [Reference: Hazardous Chemicals Desk Reference, N. Irving Sax/Richard J. Lewis, Sr., 1987.]

c. Lead is a poison by ingestion. It affects the central nervous system. It is a carcinogen of the lungs and kidneys. [Reference: Hazardous Chemicals Desk Reference, N. Irving Sax/Richard J. Lewis, Sr., 1987.]

d. Chromium is toxic. Certain chromium compounds are carcinogens. Targets include blood, lungs, respiratory system, liver, kidneys, eyes, and skin. Dermal contact can cause primary irritation and ulceration as well as allergic eczema. Inhalation can cause nasal irritation and septal perforation. Pulmonary irritation, bronchogenic carcinoma may result from breathing chromate dust. Ingestion may lead to severe irritation of the gastrointestinal tract, circulatory shock and renal damage. [Reference: The Merck Index, Eleventh Edition, Merck & Co., Inc., Rahway, N.J. 1989]

e. Lead is toxic. It is most common in young children with a history of pica. It may induce increased intracranial pressure and cause anorexia, vomiting, malaise, and convulsions. [Reference: The Merck Index, Eleventh Edition, Merck & Co., Inc., Rahway, N.J. 1989]

f. Mercury is toxic and is readily absorbed via respiratory tract (elemental mercury vapor and mercury compound dusts), skin, and gastrointestinal tract. Certain mercury salts have violent corrosive effects on skin and mucous membranes, severe nausea, vomiting, abdominal pain, bloody diarrhea, kidney damage, and death. Chronic toxicity includes muscle tremors, depression, irritability, and nervousness. [Reference: The Merck Index, Eleventh Edition, Merck & Co., Inc., Rahway, N.J. 1989]

11. Exposure Pathways:

The exposure pathways for the releases identified at the facility are the following:

a. Soils. Hazardous constituents in the soil may migrate off-site either through run-off to surface water bodies or through leaching into the groundwater. In addition, there is a potential for direct contact by workers at the facility, direct contact by off-site exposure to soils contaminated by run-off, or wind dispersal of surface soils.

b. Surface Water. The major surface water body nearest the CPC facility is Las Lajas Creek which was channeled through a concrete conduit underground and routed along the western and northern portions of the site. This creek returns to an open channel at a point north of the refinery's wastewater treatment facilities.

c. Ground Water. Hazardous constituents in the ground water may migrate to the nearest surface water body, Las Lajas Creek, which discharges to San Juan Bay.

d. Air. Volatile hazardous constituents in the soil, surface water, or ground water can volatilize into the air, promoting inhalation and direct contact of hazardous constituents. In addition, re-deposition of hazardous constituents can occur through wind dispersal of contaminated surface soils.

V. EPA's Determinations and Conclusions of Law

Based on the Findings of Fact above, and the entire administrative record, the Director of the Air and Waste Management Division, EPA Region II, has determined as a matter of law, that:

1. Respondent is a "person" as defined by Section 1004(15) of the Act, 42 U.S.C. § 6903(15).

2. Respondent is the "owner" and "operator" of a "facility" that presently "generates" and "stores" and in the past has "disposed" of "hazardous waste," as those terms are defined in Section 1004 of the Act and/or 40 C.F.R. § 260.10.

3. Respondent's facility was authorized to operate as an interim status facility pursuant to Section 3005(e) of the Act, 42 U.S.C. § 6925(e).

4. Certain wastes found at Respondent's facility are hazardous wastes and/or hazardous constituents as those terms are defined by Section 1004(5) of the Act, 42 U.S.C. § 6903(5) and 40 C.F.R. §§ 260.10, 261.3 and Appendix VIII of 40 C.F.R. Part 261.

5. There is or has been a release of hazardous wastes and/or hazardous constituents to the environment from the Respondent's facility; and

6. The actions required to be taken pursuant to this Order are necessary to protect human health and/or the environment.

VI. Order: Work to be Performed:

Pursuant to Section 3008(h) of the Act, 42 U.S.C. §6928(h), Respondent is hereby ordered to perform the tasks and follow the schedule set forth in and established pursuant to the terms of this Order. All work undertaken pursuant to this Order shall be performed in a manner consistent and in accordance with the specifications of the plans, reports and schedules approved by EPA. Attachments I, II, III are incorporated by reference into the Order.

1. RCRA Facility Investigation (RFI).

a. RFI Workplan

Within one hundred and eighty (180) calendar days after the effective date of this Order, the Respondent shall submit a RFI Workplan to fully determine the nature and extent of any release of hazardous waste and/or hazardous constituents from the facility. The workplan, at a minimum, shall focus on all the units and areas identified in paragraphs 1 and 2 immediately below:

1) Known SWMUs, AOCs, and other areas at which there are known releases:

- AOC #12 - Old Gasoline Loading Rack Area
- LPG Tank Area (hydrocarbon release)
- Intersection of Avenue D and 5th Street (hydrocarbon release)
- Intersection of Avenue D and Sixth Street (hydrocarbon release)
- Avenue C between 4th and 5th Streets (hydrocarbon release)
- SWMU #1 - Container Storage Area
- SWMU #2 - Slop Oil Tank 1000

- SWMU #3 - Slop Oil tank 1001
- SWMU #4 - Solids Knockout Pit
- SWMU #5 - Surge Tank ET-1
- SWMU #6 - API Separator
- SWMU #7 - Corrugated Plate Interceptor
- SWMU #8 - Equalization Basin
- SWMU #9 - Inlet Basin to Biological Reactor #1
- SWMU #10 - Digester
- SWMU #13 - Slop Oil Tank 452
- SWMU #19 - Natural Aeration Basin
- AOC #1 - Crude Unit Charge Pump
- AOC #2 - Fuel oil Transfer Pump (Cummins) Area
- AOC #3 - Fuel Oil Transfer Pump Area near Tank 603
- AOC #4 - Asphalt Heater Unit
- AOC #5 - Fuel Oil Loading Rack Pump Area
- AOC #6 - Debutanizer Reboiler Area
- AOC #7 - FCC Unit Compressor Lube System Area
- AOC #8 - Heat Exchanger Bundles at Heavy Cycle Steam Generator
- AOC #9 - Crude Unit #1 Area
- AOC #10 - Crude Unit #1 near Heat Exch. Bundle Area
- AOC #11 - Fuel Oil Pipeline Spill Areas

2) Known SWMUS at which there is a potential for release:

- SWMU #11 - Old Oil Lagoons
- SWMU #12 - Old East Separator
- SWMU #32 - Old landfill
- SWMU #33 - Nonhazardous disposal site
- SWMU #34 - Sulfur Lagoon
- SWMU #35 - Catalytic waste pond
- SWMU #36 - Lagoon
- SWMU #37 - Sulfur Drum Storage Area
- SWMU #38 - Centrifuge
- SWMU #39 - Gravity Thickener
- SWMU #40 - Scrap Metal Yard

3) Pursuant to a schedule approved by EPA, the RFI Workplan shall be amended to incorporate any additional work required pursuant to Section VII of this Order.

b. Scope of Work.

The RFI Workplan shall, at a minimum, address all applicable requirements specified in Task I through VII

of the Scope of Work for a RCRA Facility Investigation, included as Attachment II to this Order.

Respondent shall perform the following tasks in accordance with Attachment II:

1) Task I--Description of Current Conditions: This task shall be completed and submitted as part of the RFI Workplan in accordance with Attachment II.

2) Task II--Pre-Investigation Evaluation of Corrective Measure Technologies: This task shall be completed and submitted as part of the RFI Workplan in accordance with Attachment II.

3) Task III--RFI Workplan Requirements: The RFI Workplan shall address the requirements described in Task III of Attachment II and those requirements designed to gather the data and information described in Task IV of Attachment II to this Order.

4) Task IV--Facility Investigation: Respondent shall complete Task IV in Attachment II in accordance with the schedule in the approved RFI Workplan.

5) Task V--Investigation Analysis: Respondent shall conduct an investigation analysis in accordance with Task V in Attachment II. Task V shall be completed in accordance with the schedule in the approved RFI Workplan.

6) Task VI--Laboratory and Bench Scale Studies: Respondent shall conduct Task VI in accordance with Attachment II and provide a schedule for submittal of the results of Task VI or provide justification why Task VI is not needed. This schedule or justification that Task VI is not needed shall be submitted with the draft RFI Report.

7) Task VII--Reports to be submitted during the RFI phase: Respondent shall comply with the requirements of Task VII of Attachment II to this Order from the effective date of this Order until its termination and satisfaction.

c. <u>RFI Report and Summary Report</u>

1) Within ninety (90) calendar days after completion of the Facility Investigation and Investigation

Analysis (Tasks IV and V of Attachment II), the Respondent shall submit a RFI Report and a RFI Summary Report, which are considered to be draft.

The draft RFI Report shall describe the procedures, methods, and results of all facility investigations of SWMUs and other areas and their releases, including information on the type and extent of contamination at the facility, sources and migration pathways, and actual or potential receptors. The RFI Report shall present all information gathered under the approved RFI Workplan. The RFI Report must contain adequate information to support further corrective action decisions at the facility.

The RFI Summary Report shall describe more briefly the procedures, methods, and results of the RFI.

2) Respondent shall develop the final RFI Report, which shall incorporate changes responsive to EPA's comments on the draft RFI Report and RFI Summary Report. The final RFI report shall be developed and submitted to EPA within the time frame established by EPA in its cover letter transmitting EPA's comments on the Draft RFI Report.

d. If any of the items required by Task III through V of Attachment II have already been submitted or completed, the Respondent, for those items, may instead provide the following in the RFI workplan: (1) a description of the items and/or summary of findings, and (2) description of investigations addressing the items, documents/reports of the investigations with dates, and summary of the findings. Respondent shall provide copies of any document/report to EPA upon request. EPA will determine the adequacy and/or the extent to which prior submissions or completions may satisfy specific items required by this Order.

e. Respondent shall provide written justification for any omissions or deviations from the minimum requirements of Attachment II. Any such omission or deviation must be approved by EPA.

f. Guidance to be Used in Conducting RFI

The RFI shall be implemented in accordance with the Act, its applicable implementing regulations and EPA guidance documents, including, but not limited to, the following: 1) RCRA Facility Investigation (RFI) Guidance, (EPA publication 530/SW-89-031); 2) RCRA Ground-water Monitoring Technical Enforcement Guidance Document, (Office of Solid Waste and Emergency Response Directive 9950.1, September 1986); and 3) Test Methods for Evaluating Solid Waste (EPA publication SW-846, as amended).

2. Corrective Measures Study (CMS):

a. CMS Workplan

Within sixty (60) calendar days of receipt of EPA's written approval of the final RFI Report and a statement by EPA that a CMS is necessary, Respondent shall submit a draft CMS Workplan for EPA's approval. The purpose of the CMS is to develop and evaluate corrective measures to remediate any contamination at the facility.

b. The CMS Workplan shall include, at a minimum, the following:

1) a description of the general approach to investigating and evaluating potential remedies;

2) a definition of the overall objectives of the study;

3) the specific plans for evaluating remedies to ensure compliance with remedy standards;

4) the schedule for conducting the study;

5) the proposed format for the presentation of information; and

6) Tasks I through III set forth in Attachment III to this Order.

c. Respondent shall develop the final CMS Workplan, which shall incorporate changes responsive to EPA's comments, if any, on the draft CMS Workplan. The final CMS Workplan shall be developed and submitted to EPA within the time frame established by EPA in its cover letter transmitting EPA's comments on the Draft CMS Workplan.

d. CMS Implementation

1) No later than thirty (30) calendar days after the Respondent has received written approval from EPA for the CMS Workplan, Respondent shall implement the CMS Workplan in accordance with the schedules specified in the CMS Workplan.

2) Respondent shall conduct the following Tasks in accordance with the terms and schedules of the approved CMS Workplan, as well as the terms of this Order:

a) Task I--Identification and Development of the Corrective Measure Alternative or Alternatives: Respondent shall conduct Task I in accordance with Attachment III to this Order. The results from this Task shall be included in the CMS Report discussed below.

b) Task II--Evaluation of the Corrective Measure Alternative or Alternatives: Respondent shall conduct Task II in accordance with Attachment III. The results from this task shall be included in the CMS Report discussed below.

c) Task III--Justification and Recommendation of the Corrective Measures: Respondent shall conduct Task III in accordance with Attachment III. The results from this task shall be included in the CMS Report discussed below.

e. CMS Report

1) Within sixty (60) calendar days after the completion of the CMS, Respondent shall submit a draft CMS Report in accordance with the requirements of Task IV of Attachment III. The draft CMS Report shall present all information gathered under the approved CMS Workplan. The draft CMS Report shall summarize the results of the investigations for each remedy studied and of any bench-scale or pilot tests conducted. The draft CMS Report must include an evaluation of each remedial alternative and the Respondent's recommended alternative and its justification.

2) Based on preliminary results and/or the draft CMS Report, EPA may require Respondent to evaluate additional remedies or particular elements of one or more proposed remedies.

3) Respondent shall develop the final CMS Report, which shall incorporate changes responsive to EPA's comments on the draft CMS Report within the time frame established by EPA in its letter transmitting the comments on the Draft CMS Report.

f. Corrective Measure Alternative Selection

1) Based on the results of the CMS and any further evaluations of additional remedies under this study, EPA shall select a corrective measure from the corrective measure alternatives evaluated in the CMS that will

a) be protective of human health and the environment;

b) meet the concentration levels of hazardous constituents in each medium that the remedy must achieve to be protective of human health and the environment;

c) control the source(s) of release(s) so as to reduce or eliminate, to the maximum extent practicable, further releases that might pose a threat to human health and the environment; and

d) meet all applicable waste management requirements.

2) The selection of corrective measure alternative (or remedy) shall be subject to public participation as appropriate.

3) Upon completion of the public participation procedures and EPA's evaluation of the public comments, EPA shall notify Respondent of its determination on corrective measure(s).

3. Process Sewers Assessment

a. Within ninety (90) calendar days from the effective date of this Order, Respondent shall submit to EPA a draft Process Sewers Assessment Plan. See recommended guidance, Handbook--Sewer System Infrastructure Analysis and Rehabilitation, EPA/625/6-91/030. The Process Sewers Assessment Plan shall be designed to identify past releases and current releases of hazardous waste and/or hazardous constituents along the process sewer lines and include a schedule for implementing the plan and submitting the results in a report to be titled Process Sewers Assessment Report. See 4.c below.

b. Respondent shall develop a revised Process Sewers Assessment Plan, which shall incorporate changes responsive to EPA's comments, if any, on the draft Process Sewers Assessment Plan. The revised Process Sewers Assessment Plan shall be developed and submitted to EPA within the time frame established by EPA in its cover letter transmitting EPA's comments on the draft Process Sewers Assessment Plan.

c. Upon receipt of written approval from EPA of the Process Sewers Assessment Plan, Respondent shall implement the plan and submit the Process Sewers Assessment Report in accordance with the schedule in the approved plan.

The Process Sewers Assessment Report shall include, at a minimum, the following information:

1) The location of process sewers on a facility diagram and their relative location to the SWMUs, AOCs, and areas of known contamination;

2) The general dimensions, capacities, structural description of the system (supply any available drawings), joints and fittings, and maintenance/repair records and protocols;

3) The period during which the process sewers were operated;

4) The specifics on all hazardous wastes and hazardous constituents that have been or are being managed in the process sewers, to the extent available;

5) The results of any sampling and analysis required for the purpose of determining whether releases of hazardous wastes or hazardous constituents, have occurred, are occurring, or are likely to occur from the system;

6) Evidence of release(s) from the process sewers, such as cracks in piping, man-holes, joints, or fittings;

7) Evidence of sink-hole formation within 20 feet of the process sewer lines.

4. Assessment of Release to Las Lajas Creek

a. Within sixty (60) calendar days from the effective date of this Order, Respondent shall submit to EPA a draft Las Lajas Creek Assessment Plan. The Lajas Creek Assessment Plan shall be designed to identify the hazardous wastes and/or hazardous constituents released to the creek, to characterize the hydrology of the creek and its effect on ground water hydrology. CPC shall further determine the release potential from SWMUs #33, 34, and 35 (Nonhazardous Disposal Site, Sulfur Lagoon, and Catalytic Pond) to the creek pursuant to the RFI Workplan and the approved schedule therein.

The Las Lajas Creek Assessment Plan shall include, at a minimum, the following information:

- A sampling plan designed to identify any release of hazardous waste and/or hazardous constituents to the water and sediment of the creek from the wastewater treatment system; and

- Schedules for implementation of the plan and submittal of assessment report.

b. Respondent shall develop a revised Las Lajas Creek Assessment Plan, which shall incorporate changes responsive to EPA's comments, if any, on the draft Las Lajas Creek Assessment Plan. The revised Las Lajas Creek Assessment Plan shall be developed and submitted to EPA within the time frame established by EPA in its cover letter transmitting EPA's comments on the draft Las Lajas Creek Assessment Plan.

c. Upon receipt of written approval from EPA of the Las Lajas Creek Assessment Plan, Respondent shall implement the plan and submit the Lajas Creek Assessment Report in accordance with the schedule in the approved plan.

The Las Lajas Creek Assessment Report shall include, at a minimum, the following information:

- Characteristics of the creek hydrology and relation to ground water hydrology
- Sampling plan results
- Determination of whether there is an on-going release or past release of hazardous wastes and/or constituents.

The Las Lajas Creek Assessment Report shall be modified to include information regarding the impact and release potential of SWMUs 33, 34, and 35 on Las Lajas Creek upon CPC's scheduled completion of that portion of the RFI.

5. INTERIM MEASURES

a. Upon effective date of this Order, Respondent shall conduct the following interim measures:

1) Continue operation of product recovery system, as described in the Quarterly Report--Underground Recovery System, October - December 1991.

Respondent shall submit to EPA for review, in writing, any request for changes to the Underground Recovery System operation.

Upon EPA approval of requested changes, Respondent shall implement changes.

2) Continue monitoring the monitoring wells identified in the Quarterly Report--Underground Recovery System, October - December 1991, and determine the hazardous constituents in the ground water by including the hazardous constituents listed in the Target Compound List and the Target Analytes List ("TCL and TAL") in the ground water monitoring parameters until EPA revises the list of parameters.

The quarterly ground water monitoring reports shall be submitted to EPA within 45 calendar days following the end of each quarter (with the first quarter being from January to the end of March).

6. NEWLY-IDENTIFIED SOLID WASTE MANAGEMENT UNIT(S) AND NEWLY-DISCOVERED RELEASES

a. Notification Requirements for Newly Identified SWMUs

The Respondent shall notify EPA in writing of any newly-identified SWMUs (i.e., a unit or release not specifically identified by EPA by the time this Order is signed by EPA or listed in Section IV.8. or Attachment I), discovered during the course of ground-water monitoring, field investigations, interim measures, environmental audits, or other means, no later than fifteen (15) calendar days after its discovery.

b. Notification Requirements For Newly-discovered Releases

The Respondent shall notify EPA, in writing, of any release(s) of hazardous waste, including hazardous constituents, discovered during the course of groundwater monitoring, field investigation, environmental auditing, or other activities undertaken after the commencement of the RCRA Facility Investigation, no later than fifteen (15) calendar days after discovery.

7. Expedited Removal of Waste, Contaminated Material, and Contaminated Soil and Sediments (RCRA Stabilization Measures)

In situations where there are releases or potential for releases which if not addressed could result in further environmental degradation or where site/contamination characteristics lend themselves to effective measures designed to control or abate the spread of contamination, the Respondent may take remediation or removal action, for wastes, visibly impacted material, surface soil or surface sediments regardless of whether the wastes, visibly impacted material, surface soil or surface sediments are related to known releases from any of the SWMUs or AOCs at the facility.

a. Prior to taking such action, the Respondent must notify EPA of the situation. The notification must include, at a minimum:

   i. Locations of impacted areas;
   ii. Estimated amount of waste, material\media impacted;
   iii. Physical characteristics of the waste, material, soil, groundwater, sludge, or mixture;
   iv. Chemical characteristics that describe main chemical components in the waste, material, and/or media, based on information available to the Respondent;
   v. Description as to how waste, material, and/or media is to be remediated and\or disposed of.

b. Following consultation with EPA, if EPA approves the proposed expedited remedial action, Respondent shall, unless EPA indicates otherwise, submit to EPA for its approval a workplan for the implementation of such expedited remedial action. Upon approval by EPA, Respondent shall implement the action in accordance with the terms and schedules approved by EPA.

c. Within thirty (30) calendar days after the completion of the implementation of actions referenced above, the Respondent must submit to EPA a sampling plan. The purpose of a sampling plan will be to confirm that impacted areas have been remediated to the cleanup levels or to delineate the extent of further investigations for impacted areas. The sampling plan must conform to the requirements for sampling and analysis referenced in the Order and may be incorporated into other on-going investigations of the facility.

d. All transportation and disposal of waste and contaminated material, soil and sediments must comply with all applicable federal and commonwealth requirements.

VII. Additional Work

1. EPA may determine that additional investigations and/or studies of releases of hazardous waste and/or hazardous constituents, in addition to that detailed in this Order and its Attachments, is necessary to protect human health and/or the environment. Additional work shall be limited to: a) SWMUs and AOCs existing at the time the Order is signed by EPA but which are not identified in the Order and/or any releases, including future releases, from such SWMUs or AOCs; and b) releases from any new SWMUs and/or AOCs which come into existence after EPA's signing of the Order which impact the work identified in the Order. Respondent shall have the burden of demonstrating to EPA that: a) any newly identified SWMUs or AOCs did not exist prior to the date EPA signed the Order; or b) releases from any new SWMUs and/or AOCs which came into existence after EPA's signing of the Order have not, or will not, impact work under the Order.

2. If EPA determines any such additional work is necessary, it shall notify the Respondent in writing specifying the basis and reason for EPA's determination and the additional work deemed necessary (the "additional work notice"). Within fifteen days after Respondent's receipt of the additional work notice, Respondent shall either: a) begin implementation of the additional work in accordance with any schedule attached to the additional work notice; or b) if Respondent disagrees with EPA's determination that such additional work is necessary, Respondent shall submit a written Response setting forth all of its bases and reasons for disagreeing with EPA's determination and may request an opportunity to meet with EPA representatives to discuss such additional work. Based on EPA's review of Respondent's Response to the Additional Work Notice and any meeting discussing the same, EPA shall make a determination regarding the necessity of such additional work. If Respondent disagrees with this determination, it may invoke the dispute resolution procedures set forth in Section XXVIII. If the dispute resolution process determines additional work is necessary, Respondent shall submit a workplan for such work and perform such work in accordance with the standards, specifications, and schedules deemed necessary and approved by EPA.

3. All approved additional work performed by Respondent pursuant to this section shall be performed subject to and in a manner consistent with the terms and conditions of this Order. Any requirements for additional work shall be deemed to be incorporated into this Order as if fully set forth herein.

4. If EPA or Respondent identifies a current or imminent threat to human health or the environment, EPA may order Respondent to take immediate actions, pursuant to Section XIII of the Order, without the review/discussion process set forth above.

5. Any SWMU, AOC or release which does not fall within the confines of this Order, shall be addressed in either a post-closure permit, a new Order or a modification of this Order.

VIII. Minimum Qualifications for Directors and Supervisors

All work performed by the Respondent pursuant to this Order shall be under the direction and supervision of an individual(s) who has demonstrated expertise in hazardous waste site investigations and remediation. Before any work is performed, Respondent shall notify EPA in writing of the name, title, and qualifications of the supervisory personnel and contractors or subcontractors and their personnel to be used in carrying out the terms of this Order. In addition, the Respondent shall ensure that when a license is required, only licensed individuals shall be used to perform any work required by this Order.

IX. Project Coordinator/Information

1. On or before the effective date of this Order, EPA and Respondent shall each designate a Project Coordinator ("PC") and the name of at least one alternate who may function in the absence of the designated Project Coordinator. Both Project Coordinators shall be responsible for overseeing the implementation of this Order. The EPA Project Coordinator, or his designee, will be EPA's designated representative at the facility.

2. Unless otherwise specified in this Order, all communications between Respondent and EPA, and all documents, reports, approvals, and other correspondence concerning the activities performed pursuant to the terms and conditions of this Order, shall be directed to and through the respective Project Coordinators. Unless otherwise specified, reports, correspondence, approvals, disapprovals, notices, or other submissions relating to or required under this Order shall be in writing and originals or copies shall be sent to:

3 copies: Andrew Bellina, P.E.
Chief
Hazardous Waste Facilities Branch
U.S. EPA Region II
290 Broadway-22nd Floor
New York, N.Y. 10007-1866

1 copy: Carl-Axel Soderberg
EPA-Caribbean Field Office
Office 2A Podiatry Center Bldg.
1413 Fernandez Juncos Avenue
Santurce, Puerto Rico 00909

1 copy: Israel Torres
Land Pollution Control Area
Puerto Rico Environmental Quality Board
P.O. Box 11488
Santurce, Puerto Rico 00910

3. Each party shall provide at least five (5) days written notice prior to changing the Project Coordinator(s) and shall immediately provide written notification to all of the above addressees once a new Project Coordinator is selected.

X. Quality Assurance/Quality Control

1. All sampling, monitoring, analytical, and chain-of-custody plans shall be developed in accordance with the standards and recommended procedures contained in SW-846 - "Test Methods for the Chemical and Physical Analysis of Solid Waste", as amended, and the EPA Region II Quality Assurance Manual. Any deviations from these two documents must be accompanied by an appropriate justification and a demonstration of the effectiveness and applicability of the proposed alternative. EPA must approve the use of such alternatives in writing. The submission of such a justification shall not stay any compliance date in, or pursuant to, the Order.

2. Respondent shall inform the EPA Project Coordinator in advance which laboratories will be used by Respondent and ensure that EPA personnel and EPA-authorized representatives have access to the laboratories and personnel performing any analyses. In the event that EPA or its representatives cannot satisfactorily obtain access to the laboratories for any reason for the purposes of auditing protocols and technical proficiency, then EPA shall so inform the Respondent and the Respondent shall, within thirty (30) days, substitute another certified laboratory which provides access in a manner deemed satisfactory to EPA.

3. Respondent shall consult with EPA in planning for field sampling and laboratory analysis, including a description of the chain of custody procedures to be followed.

XI. EPA Approvals

1. Unless otherwise specified, EPA shall review any plan, report, specification or schedule submitted pursuant to, or required by this Order, and provide its written approval or, disapproval, with comments and/or modifications, to the Respondent. Unless otherwise specified by EPA, the Respondent shall submit a revised document within thirty (30) days of its receipt of EPA's written comments and/or modifications. Any such revised document submitted by the Respondent shall incorporate EPA's comments and/or modifications. EPA will then approve the revised document, or modify the document and approve it with any such modifications. The revised document, as approved by EPA, shall become final. All final approvals shall be given to the Respondent in writing.

2. Unless otherwise specified in the approved workplan, Respondent shall commence work within fourteen (14) days of receipt of EPA's written approval for each workplan developed pursuant to this Order. Any noncompliance with such EPA-approved plan, report, specification, or schedule shall be considered a violation of this Order.

3. Any reports, plans, specifications, or schedules, submitted pursuant to, or required by this Order, are hereby incorporated by reference into this Order following the date written approval of such document is given by EPA. Prior to this written approval, no plan, report, specification or schedule shall be construed as finally approved. Verbal advice, suggestions, or comments given by EPA representatives will not constitute an official approval, nor shall any verbal approval or verbal assurance of approval be considered binding.

XII. On-site and Off-site Access

1. Respondent shall permit EPA and EQB representatives, authorized designees, employees, agents, contractors, subcontractors, or consultants to enter and freely move about the facility for, but not limited to, the following purpose(s):

a) interviewing facility personnel, contractors (including subcontractors and independent contractors), or any other entity or individual responsible for implementing any aspect or portion of this Order;

b) inspecting records relating to the facility and this Order;

c) Conducting sampling, monitoring, or any other such activity which EPA or the Project Coordinator deems necessary;

d) using a camera, sound recording, video or any other documentary type equipment;

e) Verifying the reports and data submitted to EPA by the Respondent; and/or

f) determing compliance with RCRA, the regulations thereunder, and any other federal environmental law and/or regulation.

2. The Respondent shall make available to EPA, or any of the persons/entities identified in paragraph 1 of this section, for inspection, copying, or photographing, all records, files, photographs, documents, or any other writing, including monitoring and sampling data that pertain to any work undertaken pursuant to this Order, or the Act and the regulations promulgated thereunder.

3. To the extent that work required by this Order must be performed on property not owned or controlled by the Respondent, the Respondent shall use its best efforts to obtain a "Site Access Agreement" to perform such work within thirty (30) days of the date Respondent becomes aware or should be aware of a need to perform such work. Any such Access Agreement shall provide for reasonable access by EPA, EQB, and any of the persons/entities listed in paragraph 1 of this section. In the event that a Site Access Agreement is not obtained within the thirty-day period, the Respondent shall notify EPA, in writing, documenting its best efforts to obtain such agreements. Best efforts, as used in this paragraph, shall include, at a minimum:

a) A certified letter from the Respondent to the present owner of such property requesting permission to allow the Respondent, EPA and any of their authorized representative(s) access to such property or portion thereof; and

b) The property owner's response, if any.

4. Nothing in this Order shall be construed to limit or otherwise affect EPA's right of access and entry pursuant to any other applicable laws and regulations, including Section 3007 of the Act and the Comprehensive Environmental Response Compensation and Liability Act of 1980 ("CERCLA"), as amended, 42 U.S.C. § 9601 et seq.

5. Nothing in this section shall be construed to limit or otherwise affect the Respondent's liability and obligation to perform corrective action, including corrective action beyond the facility boundary, notwithstanding the lack of access. EPA may determine that additional on-site measures must be taken to address releases beyond the facility boundary if access to off-site areas cannot be obtained.

XIII. Emergency Provisions

1. In the event the Respondent identifies a current or imminent threat to human health or the environment, the Respondent shall notify EPA orally as soon as practicable and notify EPA in writing within ten (10) days, summarizing the nature, immediacy, and magnitude of the actual or potential threats to human health or the environment. The Respondent shall, as soon as possible, submit to EPA for its approval, a plan to mitigate such threat. EPA will approve or modify this plan, and the Respondent shall implement this plan as approved or modified by EPA. If EPA determines that quicker action is required, then the Director of the Air and Waste Management Division, Region II, may orally authorize Respondent to act prior to Respondent's making any written submission to EPA. In the case of an extreme emergency, Respondent may act without prior EPA approval; any such unapproved action shall be taken at Respondent's own risk, and Respondent shall be responsible for any different or additional action subsequently required by EPA to mitigate the threat(s) or the consequences of the unapproved action.

2. If EPA identifies a current or imminent threat to human health and environment, or determines that activities in compliance or non-compliance with this Order, have caused or may cause a release of a hazardous waste or hazardous constituents, or may pose a threat to human health or the environment, EPA may direct Respondent to stop further implementation of this Order, or a portion of this Order, for such period of time as may be needed to abate any such release or threat and/or require Respondent to undertake any action or perform any work EPA determines to be necessary.

3. Work required under the Emergency Provision of the Order shall be limited to interim measures and stabilization.

XIV. Availability of Information/Notification

1. Respondent shall give the EPA Project Coordinator twenty (20) days advance oral notice of the following activities undertaken pursuant to this Order: all well monitoring activities, including, but not limited to, drilling, installation and testing; and all on-site and off-site field activities, such as installation or removal of equipment, or sampling events, geophysical studies, or soil gas monitoring. At the request of EPA, Respondent shall provide or allow EPA or its authorized representatives to take split samples of any or all samples collected by the Respondent pursuant to this Order.

2. All data, information, and records created for or maintained by the Respondent pursuant to this Order shall be made available to EPA upon request. Respondent shall use its best efforts to insure that all employees of the Respondent and all persons, including contractors and subcontractors who engage in activities under this Order, are made available to, and cooperate with, EPA if information, whether written or oral, is sought.

3. All information, data, or records submitted to EPA by the Respondent shall be made available to the public including plans submitted by the Respondent pursuant to Attachments II and III. Respondent may assert a business confidentiality claim covering all or part of any information submitted to EPA. Any assertion of confidentiality shall be accompanied by sufficient documentation to justify the requirements of 40 C.F.R. § 2.204(e)(4). Information determined to be confidential by EPA shall be disclosed only to the extent permitted by 40 C.F.R. Part 2.

4. Respondent agrees not to assert any confidentiality claim with regard to any analytical data developed pursuant to this Order.

XV. Record Preservation

1. Respondent shall preserve or make arrangements for the preservation of, during the pendency of this Order and for a minimum of six (6) years after its termination, as specified in Section XXI of this Order, all data, records and documents in its possession or in the possession of its division, officers, directors, employees, agents, consultants, contractors (including subcontractors and independent contractors) which relate in any way to this Order, to its implementation or to the past and/or current hazardous waste management practices at the facility. The Respondent shall make such records available to EPA and/or shall provide copies of any documents that EPA requests. Written

notification shall be provided to EPA, ninety (90) days prior to the destruction of any or all such documents. Such written notification shall reference the date, caption, and docket number of this Order and shall be addressed to the Regional Administrator of U.S. EPA Region II with copies sent to the individuals listed in Section IX.2. of this Order.

2. All documents pertaining to this Order shall be stored in a centralized location to afford ease of access.

XVI. Reservation of Rights

1. EPA expressly reserves, without limitation, all of its statutory and regulatory powers, authorities, rights, remedies and defenses, both legal and equitable, including the right to seek injunctive relief, cost recovery, monetary penalties, and/or punitive damages.

2. This Order shall not be construed as a covenant not to sue, or as a release, waiver or limitation of any rights, remedies, defenses, powers and or authorities which EPA has under RCRA, CERCLA, or any other statutory, regulatory or common law authority of the United States.

3. This Order shall not limit or otherwise preclude EPA from taking any additional legal action against the Respondent should EPA determine that any such additional legal action is necessary or warranted.

4. This Order shall not relieve the Respondent of its obligation to obtain and comply with any federal, Commonwealth, county or local permit, nor is this Order intended to be, nor shall it be construed to be, a ruling or determination on, or of, any issue related to any federal, Commonwealth, county, or local permit.

5. EPA reserves the right to perform any portion of the work required by this Order including, but not limited to, any additional site characterization, feasibility study, interim measure, and/or response or corrective action deemed necessary to protect human health or the environment. EPA may exercise its authorities under Section 7003 of RCRA and/or Section 106 of CERCLA, or any other applicable authority to order or undertake removal and/or remedial actions at any time.

6. Notwithstanding compliance with the terms of this Order, Respondent is not released from liability for the costs of any response actions taken by EPA. EPA reserves the right to seek reimbursement from Respondent for any costs incurred by the United States.

7. If Respondent fails to comply with any terms or any provisions of this Order, EPA reserves the right to commence a subsequent action to require compliance, including the payment of stipulated penalties and/or to take any other action authorized by law.

XVII. Non-Release of Other Claims and Parties

Nothing in this Order shall constitute, or be construed to constitute, a release from any claim, cause of action or demand in law or equity against any person, firm, partnership, or corporation for any liability it may have arising out of, or relating in any way to, the generation, storage, treatment, handling, transportation, release, or disposal of any hazardous constituent, hazardous substance, hazardous waste, pollutant, or contaminant found at, taken to, taken from, or emanating from the Facility.

XVIII. Public Participation

1. Following each of the following events: final written approval of the final RCRA Facility Investigation Report and the Corrective Measures Study Report (if necessary), EPA shall make these documents and any EPA summaries of these, available for public review and comment, as appropriate.

XIX. Indemnification of the United States Government

Respondent shall indemnify, save and hold harmless the United States Government, its agencies, departments, agents, and/or employees, from any and all claims or causes of action arising from or on account of acts or omissions of Respondent or its agents, independent contractors, receivers, trustees, subcontractors or successors and/or assigns in carrying out activities required by this Order. This indemnification shall not be construed as in any way affecting or limiting the rights or obligations of the Respondent or the United States under their various contracts or statutes.

XX. Other Applicable Laws

Respondent shall undertake all actions required by this Order in accordance with the requirements of all applicable local, Commonwealth and federal laws and regulations. Respondent shall obtain all permits and approvals necessary to perform the work required by this Order.

XXI. Termination and Satisfaction

The provisions of this Order shall be deemed satisfied and the obligations of the Respondent under this Order shall terminate upon Respondent's receipt of a written statement from EPA that Respondent has completed, to EPA's satisfaction, all the terms and conditions of this Order, including any additional work which EPA has determined to be necessary pursuant to this Order. So long as the Respondent is performing work pursuant to, or required by this Order, this Order shall not be deemed terminated or satisfied. At any time after Respondent completes all of the tasks required by this Order, including additional work requirements, Respondent may request in writing that EPA provide Respondent with this statement of completion. After reviewing Respondent's request, EPA will provide Respondent with this statement of completion, or a written statement as to the basis for a refusal to provide Respondent with such statement of completion.

XXII. Survivability/Permit Integration

After the effective date of this Order, a RCRA/HSWA post-closure permit may be issued to the Facility incorporating the requirements of this Order by reference into the permit. Any requirements of this Order shall not terminate upon the issuance of a permit unless the requirement(s) are expressly replaced by equivalent or more stringent requirements in the permit and EPA approves such termination. If EPA approves the termination of specific requirements of this Order upon the issuance of a permit, this Order must be accordingly modified pursuant to Section XXIII below.

XXIII. Modification

1. This Order may be jointly amended by Respondent and EPA. Such amendments shall be in writing, shall first be signed by an authorized representative of the Respondent, and shall have as their effective date the date on which they are signed by the Director of the Air and Waste Management Division, Region II, U.S. EPA.

2. Notwithstanding the above, the EPA Branch Chief of the Air and Waste Management Division, Hazardous Waste Facilities Branch, Region II and the Respondent may agree to changes in the scheduling of events. Any such changes must be requested in writing by the Respondent and be approved in writing by the EPA Branch Chief of the Air and Waste Management Division, Hazardous Waste Facilities Branch, Region II.

3. No informal advice, guidance, suggestions, or comments by EPA regarding reports, plans, specifications, schedules, and any other writing submitted by the Respondent will be construed as an amendment or modification to this Order.

XXIV. No Final Agency Action

1. Notwithstanding any other provision of this Order, no action or decision by EPA pursuant to this Order, including without limitation, decisions of the Director of the Air and Waste Management Division for Region II, or any authorized representative of EPA, shall constitute final agency action giving rise to any rights of judicial review prior to EPA's initiation of a judicial action for a violation of this Order, which may include an action for penalties or an action to compel Respondent's compliance with the terms and conditions of this Order.

2. In any action brought by EPA for a violation of this Order, Respondent shall bear the burden of proving that EPA's action was arbitrary and capricious and not in accordance with the law, or this Order.

XXV. Severability

If any provision or authority of this Order or the application of this Order to any party or circumstance is found to be invalid or is temporarily stayed by the Director of the Air & Waste Management Division or by the terms of this Order, the remainder of this Order shall remain in force and shall not be affected thereby.

XXVI. Stipulated Penalties

1. Unless this Order has been modified pursuant to Section XXIII or unless the Respondent is excused under the "Force Majeure and Excusable Delay" provision of Section XXVII, or excused under the Dispute Resolution provision set forth in Section XXVIII, if the Respondent fails to comply with any requirement, term, or condition set forth in or required by this Order, it shall pay a Stipulated Penalty for each non-complying act as follows:

Deliverable	Stipulated Penalty For Each Day of Non-Compliance		
	1st through 10th day	11th through 30th day	31st day and beyond
Interim Measures	$1,500	$2,500	$3,500
RFI or CMS Workplan	$1,500	$2,500	$3,500
Quarterly Progress Reports	$500	$1,000	$2,500
Draft RFI or CMS Report	$2,000	$3,000	$5,000
Final RFI or CMS Report	$2,000	$3,000	$5,000
Notification of New Information Related to Potential Threats to Human Health or the Environment	$2,500	$5,000	$6,000
Submittal of Document Revisions	$500	$1,000	$1,500
Commence Work	$2,500	$5,000	$6,000

2. All penalties shall begin to accrue on the date that complete performance of a specific task is due or a violation occurs, and shall continue to accrue through the final day of non-compliance or complete correction of the non-compliance, whichever is later.

3. Interest shall also accrue on any amount owed at the rate established by the Secretary of the Treasury pursuant to 31 U.S.C. § 3717.

4. All penalties owed to EPA under this Section shall be due and payable within twenty days of Respondent's receipt from EPA of a written demand for payment of the penalties, subject to the Dispute Resolution provision (Section XXVIII) of this Order. Such written demand will describe the violations and will indicate the date upon which penalties began or begin to accrue as set forth in paragraph 2 of this Section. Stipulated penalties shall continue to be due through the final day of non-compliance or complete correction of the non-compliance, whichever is later, notwithstanding the date of EPA's demand letter. Stipulated penalties shall be paid by cashier's or certified check made payable to "Treasurer of the United States" and shall be mailed to Regional Hearing Clerk, U.S. Environmental Protection Agency, P.O. Box 360188M, Pittsburgh, Pennsylvania 15251, unless another entity or official is designated by EPA. The check shall reference the complete name and address of the Respondent, the name of this Order, and its docket number. A copy of the check and letter forwarding the check shall also be submitted to the EPA Project Coordinator.

5. The stipulated penalty set forth above shall not in any way alter or relieve the Respondent from any obligation or responsibility imposed by or under the terms of this Order. Moreover, nothing in this subparagraph or Section shall be construed as prohibiting, altering, or in any way limiting EPA's ability to seek or impose any other remedy, sanction, or penalty.

6. No payments made under this Section shall be claimed or used as a tax deduction by the Respondent.

7. In any action concerning the stipulated penalty provided for in this Section, the Respondent shall have the burden of proving that it was at all times strictly complying with the terms and conditions of this Order.

XXVII. Force Majeure and Excusable Delay

1. Respondent shall perform all the requirements of this Order within the time limits set forth, approved, or established herein, unless the performance is prevented or delayed solely by events which constitute a force majeure. A force majeure is defined as any event arising from causes not reasonably foreseeable and beyond the control of the Respondent which could not be overcome by due diligence and which delays or prevents performance by a date required by this Order. Such events do not include unanticipated or increased costs of performance, changed economic circumstances, normal precipitation events, or failure to obtain federal, state, or local permits (unless such permitting delays are due solely to the permitting authority).

2. The Respondent shall notify in writing the EPA Project Coordinator within five (5) days after it becomes aware of any event, which it knows or should know, constitutes a force majeure. Such notice shall detail the estimated length of delay, including necessary demobilization and remobilization, its causes, measures taken or to be taken to minimize the delay, and an estimated timetable for implementation of these measures. Respondent must adopt all reasonable measures to avoid and minimize the delay. Failure to comply with the notice provision of this section shall constitute a waiver of Respondent's right to assert a force majeure and shall be grounds for EPA to deny Respondent an extension of time for performance.

3. After receiving such notice from Respondent that Respondent is invoking the force majeure provisions of this Order, EPA shall respond in writing indicating either EPA's agreement that the event constitutes a force majeure or its disagreement and the reasons therefore.

4. If the Parties agree that a force majeure has occurred, the time for performance may be extended, upon EPA approval, for a period equal to the delay resulting from such circumstances. This shall be accomplished through written amendment to this Order pursuant to Section XXIII. Such an extension does not alter the schedule for performance or completion of any other tasks required by this Order unless these are also specifically altered by amendment of this Order.

5. In the event the Parties cannot agree that any delay or failure has been or will be caused by a force majeure, or if there is no agreement on the length of the extension, the dispute will be resolved in accordance with the Dispute Resolution provisions contained in Section XXVIII of this Order.

XXVIII. Dispute Resolution

1. Both parties shall use their best efforts to informally and in good faith resolve all disputes and differences of opinion. Notwithstanding the above, if Respondent disagrees, in whole or in part, with any disapproval or modification or other decision or directive made by EPA pursuant to this Order, Respondent shall notify EPA of its objections and the basis (bases) therefore within fifteen (15) calendar days of receipt of EPA's disapproval, modification, decision, or directive. Said notice shall set forth the specific points of the dispute, the position Respondent is maintaining, the basis (bases) for Respondent's position, and any matters Respondent considers necessary for EPA's determination. Upon EPA's receipt and consideration of such written notice, the Director of the Air and Waste Management Division, Region II, shall provide to Respondent his decision on the pending dispute, which decision shall be binding on both parties to this Order. EPA's decision shall not be arbitrary and capricious under EPA's existing laws, regulations and/or policies. CPC shall have the burden of proving EPA's determination was arbitrary and capricious.

2. The existence of a dispute as defined herein, and EPA's consideration of such matters as placed into dispute shall excuse, toll, or suspend during the pendency of the dispute resolution process the compliance obligation or deadline which is in dispute and any other obligation or deadline which is demonstrably dependent on the matters in dispute, and EPA shall not seek to assess a penalty for noncompliance with the obligation or deadline for the period of time during which the obligation or deadline was excused, tolled, or suspended, regardless of the decision on the dispute with the following two exceptions: (1) No obligation or deadline shall be excused, tolled, or suspended, unless the Director of the Air and Waste Management Division, Region II, determines that Respondent exercised due diligence to resolve the dispute; and (2) No obligation or deadline shall be excused, tolled, or suspended, unless the Director of the Air and Waste Management Division, Region II, determines that Respondent invoked the dispute resolution procedure in good faith.

XXIX. Effective Date

The effective date of this Order shall be ten days after the date on which the Director of the Air and Waste Management Division, U.S. EPA Region II, signs this Order.

XXX. Consent

Respondent consents to and agrees not to contest EPA's jurisdiction to issue this Order. In addition, whether brought in an administrative or judicial proceeding, the Respondent consents to and agrees not to contest EPA's jurisdiction to enforce or compel compliance with any term of this Order, including the collection of stipulated penalties.

Finding this Order to be accurate and reasonable, the Respondent consents to its issuance and its terms, and agrees to undertake all actions required by the terms and conditions of this Order, including any portions of the Order incorporated by reference. Respondent consents to the issuance of this Order, as an Order, pursuant to Section 3008(h) of RCRA, 42 U.S.C. § 6928(h), and explicitly waives its right to request a hearing on this matter. Finally, the Respondent agrees not to contest, and waives any defense concerning the validity of this Order, or any particular provision contained herein.

The signatory to this Order for Respondent certifies that he or she is fully authorized to enter into the terms and conditions of this Order.

Caribbean Petroleum Corporation
Respondent's Name

9-5-95
Date

WILFREDO RODRIGUEZ
Signatory's Name (Print)

Signature

MANAGING DIRECTOR
Signatory's Title (Print)

It is so Ordered:

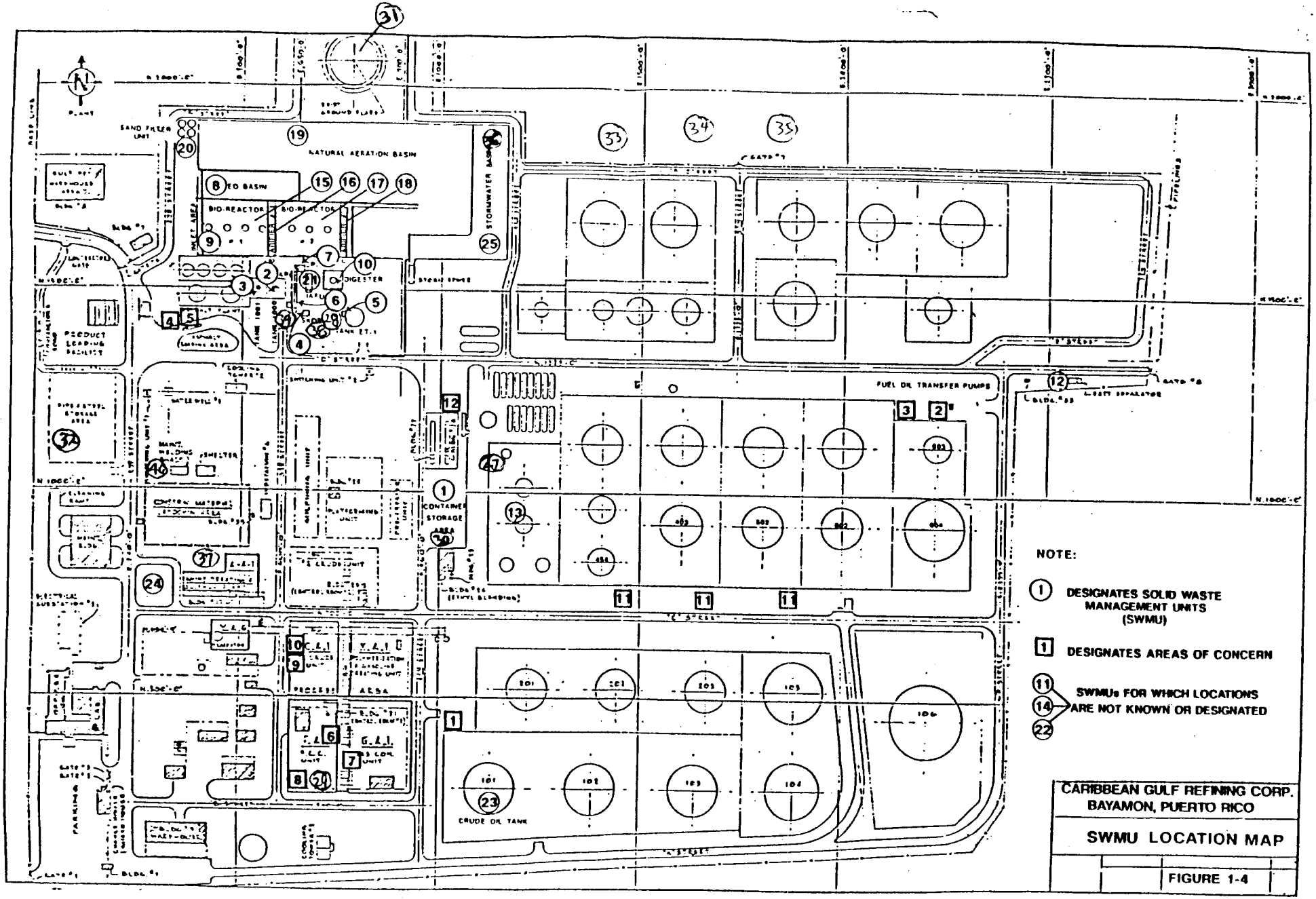
Conrad Simon, Director
Air and Waste Management Division
U.S. Environmental Protection Agency
Region II
New York, New York 10278

Date: 10/12/95

INDEX OF ATTACHMENTS

ATTACHMENT I

- Facility Diagram
- List of SWMUs and AOCs
- Summary of SWMUs and AOCs Release Determination


NATURAL AERATION BASIN
SAND FILTER UNIT
EQ BASIN
BIO-REACTOR
BIO-REACTOR
DIGESTER
STORMWATER BASIN
PRODUCT LOADING FACILITY
FUEL OIL TRANSFER PUMPS
CONTAINER STORAGE AREA
CRUDE OIL TANK
NOTE:
(1) DESIGNATES SOLID WASTE MANAGEMENT UNITS (SWMU)
[1] DESIGNATES AREAS OF CONCERN
(11) (14) (22) SWMUs FOR WHICH LOCATIONS ARE NOT KNOWN OR DESIGNATED
CARIBBEAN GULF REFINING CORP.
BAYAMON, PUERTO RICO
SWMU LOCATION MAP
FIGURE 1-4
(REFERENCE 33)

SOLID WASTE MANAGEMENT UNITS AT CPC

Name of SWMU	EPA #	CPC #
Container Storage Area	1	17
Slop Oil Tank 1000	2	--
Slop Oil Tank 1001	3	--
Solids Knockout Pit	4	2
Surge Tank ET-1	5	3
API Separator	6	4
Corr. Plate Interceptor	7	5
Equalization Basin	8	--
Inlet Basin Bioreactor 1	9	--
Digester	10	14
Old Oil Lagoons	11	22 & 23
Old East Separator	12	18
Slop Oil Tank 452	13	--
Old Tr. Plant Impoundment	14	--
Bioreactor 1	15	7
Clarifier 1	16	8
Bioreactor 2	17	9
Clarifier 2	18	10
Natural Aeration Basin	19	11
Sand Filter Unit	20	12
IAF Unit	21	6
Process Sewer	22	1
Crude Oil Tank 101	23	--
Sulfur Pit	24	19
Stormwater Basin	25	13
Sulfur Recycling Plant	26	--
Tank 481	27	--
Steel Bin	28	--
Storage Area - Particulate	29	--
Waste Pile	30	--
Flare	31	--
Old Landfill	32	24
Nonhazardous Disposal Site	33	25
Sulfur Lagoon	34	26
Catalytical Waste Pond	35	27
Lagoon	36	--
Sulfur Drum Storage Area	37	--
Centifuge	38	15
Gravity Thickener	39	16
Scrap Metal Yard	40	20
Old Loading Rack	AOC 12	21

EPA's SWMU and AOC List

SWMU 1 - Container Storage Area

SWMU 2 - Slop Oil Tank 1000

SWMU 3 - Slop Oil tank 1001

SWMU 4 - Solids Knockout Pit

SWMU 5 - Surge Tank ET-1

SWMU 6 - API Separator

SWMU 7 - Corrugated Plate Interceptor

SWMU 8 - Equalization Basin

SWMU 9 - Inlet Basin to Biological Rctr #1

SWMU 10 - Digester

SWMU 11 - Old Oil Lagoons

SWMU 12 - Old East Separator

SWMU 13 - Slop Oil Tank 452

SWMU 14 - Old Treatment Plant Imp. Area

SWMU 15 - Biolog. Rctr #1

SWMU 16 - Clarifier #1

SWMU 17 - Biolog. Rctr. #2

SWMU 18 - Clarifier #2

SWMU 19 - Natural Aeration Basin

SWMU 20 - Sand Filter Unit

SWMU 21 - Induced-Air Flotation Unit

SWMU 22 - Refinery Process Sewer

SWMU 23 - Crude Oil Tank 101

SWMU 24 - Sulfur Pit

SWMU 25 - Stormwater Basin

SWMU 26 - Sulfur Recycling Plant

SWMU 27 - Tank 481

SWMU 28 - Steel Bin

SWMU 29 - Storage Area for Particulate Matter

SWMU 30 - Waste Pile

SWMU 31 - Flare

SWMU 32 - Old Landfill

SWMU 33 - Nonhazardous Disposal Site

SWMU 34 - Sulfur Lagoon

SWMU 35 - Catalytic Waste Pond

SWMU 36 - Lagoon

SWMU 37 - Sulfur Drum Storage Area

SWMU 38 - Centrifuge

SWMU 39 - Gravity Thickener

SWMU 40 - Scrap Metal Yard

AOC 1 - Crude Unit Charge Pump

AOC 2 - Fuel oil Transfer Pump (Cummins) Area

AOC 3 - Fuel Oil Transfer Pump Area near Tank 603

AOC 4 - Asphalt Heater Unit

AOC 5 - Fuel Oil Loading Rack Pump Area

AOC 6 - Debutanizer Reboiler Area

AOC 7 - FCC Unit Compressor Lube System Area

AOC 8 - Heat Exchanger Bundles at Heavy Cycle Steam Generator

AOC 9 - Crude Unit #1 Area

AOC 10 - Crude Unit #1 near
Heat Exch. Bundle Area

AOC 11 - Fuel Oil Pipeline Spill Areas

AOC 12 - Old Gasoline Loading Rack Area

SWMUs and AOCs Determinations

The following determinations are based primarily on the RCRA Facility Assessment (dated March 1989) prepared by EPA. SWMUs 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, and 40 were identified subsequent to the March 1989 RFA.

SWMU 1 - Container Storage Area	RFI recommended. Base of unit has construction seams that are not sealed.
SWMU 2 - Slop Oil Tank 1000	RFI recommended. Pooled oil and staining on the ground around the base of the tank were noted.
SWMU 3 - Slop Oil tank 1001	RFI recommended. Pooled oil and staining on the ground around the base of the tank were noted.
SWMU 4 - Solids Knockout Pit	RFI recommended. Soil sampling for confirmation was done. See results.
SWMU 5 - Surge Tank ET-1	RFI recommended. Soil sampling for confirmation was done. See results.
SWMU 6 - API Separator	RFI recommended. This unit is part of wastewater system and should be investigated because GWM data indicates releases.
SWMU 7 - Corrugated Plate Interceptor	RFI recommended. This unit is part of wastewater system and should be investigated because GWM data indicates releases.
SWMU 8 - Equalization Basin	RFI recommended. This unit is part of wastewater system and should be investigated because GWM data indicates releases.
SWMU 9 - Inlet Basin to Biological Rctr #1 regulated unit	RFI recommended. This unit is part of Equalization Basin, above.
SWMU 10 - Digester	RFI recommended. This unit is part of wastewater system and should be investigated because GWM data indicates releases.
SWMU 11 - Old Oil Lagoons	Releases have not been determined. Additional information is needed.
SWMU 12 - Old East Separator	Releases have not been determined. Additional information is needed.

SWMU 13 - Slop Oil Tank 452	RFI recommended. Evidence of release was observed on the sides of the tanks.
SWMU 14 - Old Treatment Plant Imp. Area	Releases have not been determined. Location of this unit is within the Wasterwater Treatment Plant Area and will be addressed in the WWTP Area-wide Groundwater Monitoring Program.
SWMU 15 - Biolog. Rctr #1	RFI not recommended at this time.
SWMU 16 - Clarifier #1	RFI not recommended at this time.
SWMU 17 - Biolog. Rctr. #2	RFI not recommended at this time.
SWMU 18 - Clarifier #2	RFI not recommended at this time.
SWMU 19 - Natural Aeration Basin	RFI recommended. This unit is downstream from the Equalization Basin and should be investigated because this unit may be contributing to the releases indicated by the GWM data.
SWMU 20 - Sand Filter Unit	RFI not recommended at this time.
SWMU 21 - Induced-Air Flotation Unit	RFI not recommended at this time.
SWMU 22 - Refinery Process Sewer	RFI not recommended, but an assessment of the sewer system is recommended because it may be contributing to on-going releases.
SWMU 23 - Crude Oil Tank 101	RFI not recommended at this time.
SWMU 24 - Sulfur Pit	RFI not recommended at this time.
SWMU 25 - Stormwater Basin	RFI not recommended at this time.

SWMU 26 - Sulfur Recycling Plant	RFI not recommended at this time.
SWMU 27 - Tank 481	RFI not recommended at this time.
SWMU 28 - Steel Bin	RFI not recommended at this time.
SWMU 29 - Storage Area for Particulate Matter	RFI not recommended at this time.
SWMU 30 - Waste Pile	RFI not recommended at this time.
SWMU 31 - Flare	RFI not recommended at this time.
SWMU 32 - Old Landfill	Releases have not been determined. Additional information is needed.
SWMU 33 - Nonhazardous Disposal Site	Releases have not been determined. Additional information is needed.
SWMU 34 - Sulfur Lagoon	Releases have not been determined. Additional information is needed.
SWMU 35 - Catalytic Waste Pond	Releases have not been determined. Additional information is needed.
SWMU 36 - Lagoon	Releases have not been determined. Additional information is needed.
SWMU 37 - Sulfur Drum Storage Area	Releases have not been determined. Additional information is needed.
SWMU 38 - Centrifuge (reported by CPC as SWMU 15 and is part of wastewater treatment plant)	Releases have not been determined. Additional information is needed.
SWMU 39 - Gravity thickener (reported by CPC as SWMU 16 and is part of wastewater treatment plant)	Releases have not been determined. Additional information is needed.

SWMU 40 - Scrap metal yard (reported by CPC as SWMU 20)	Releases have not been determined. Additional information is needed.
AOC 1 - Crude Unit Charge Pump	RFI recommended. Evidence of release observed from this unit.
AOC 2 - Fuel oil Transfer Pump (Cummins) Area	RFI recommended. Soil sampling indicates presence of chrysene.
AOC 3 - Fuel Oil Transfer Pump Area near Tank 603	RFI recommended. Stain observed outside curbing.
AOC 4 - Asphalt Heater Unit	RFI recommended. Stain observed outside curbing.
AOC 5 - Fuel Oil Loading Rack Pump Area	RFI recommended. Stain observed on the soil.
AOC 6 - Debutanizer Reboiler Area	RFI recommended. Evidence of multiple past releases were observed.
AOC 7 - FCC Unit Compressor Lube System Area	RFI recommended. This area lacks containment and stains were evident.
AOC 8 - Heat Exchanger Bundles at Heavy Cycle Steam Generator	RFI recommended. Soil sampling indicates presence of chrysene.
AOC 9 - Crude Unit #1 Area	RFI recommended. Stain noted outside curb. Soil sampling indicates presence of chrysene.
AOC 10 - Crude Unit #1 near Heat Exch. Bundle Area	RFI recommended. Staining observed on foundation and soil. Soil sampling indicates presence of chrysene.
AOC 11 - Fuel Oil Pipeline Spill Areas	RFI recommended. Evidence of leaks near Tank 454, Tank 403, and tank 502 noted.
AOC 12 - Old Gasoline Loading Rack Area	RFI recommended. Known release of hydrocarbon in this area.

ATTACHMENT II

SCOPE OF WORK FOR A RCRA FACILITY INVESTIGATION (RFI)

RCRA FACILITY INVESTIGATION

Task I: Description of Current Conditions

Task II: Pre-Investigation Evaluation of Corrective Measure Technologies

Task III: RFI Workplan Requirements

Task IV: Facility Investigation

Task V: Investigation Analysis

Task VI: Laboratory and Bench-Scale Studies

Task VII: Reports

SCOPE OF WORK FOR A RCRA FACILITY INVESTIGATION (RFI)

PURPOSE

The purpose of this RCRA Facility Investigation is to determine the nature and extent of releases of hazardous waste or hazardous constituents from regulated units, solid waste management units, and other source areas at the facility and to gather all necessary data to support the Corrective Measures Study, if one is determined to be necessary. The Respondent shall furnish all personnel, materials, and services necessary for, or incidental to, performing the RCRA remedial investigation.

SCOPE

The RCRA Facility Investigation consists of seven tasks:

Task I: Description of Current Conditions
- A. Facility Background
- B. Nature and Extent of Contamination
- C. Implementation of Interim Measures

Task II: Pre-Investigation Evaluation of Corrective Measure Technologies

Task III: RFI Workplan Requirements
- A. Project Management Plan
- B. Data Collection Quality Assurance Plan
- C. Data Management Plan
- D. Health and Safety Plan
- E. Community Relations Plan

Task IV: Facility Investigation
- A. Environmental Setting
- B. Source Characterization
- C. Contamination Characterization
- D. Potential Receptor Identification

Task V: Investigation Analysis
- A. Data Analysis
- B. Protection Standards

Task VI: Laboratory and Bench-Scale Studies

Task VII: Reports
- A. Preliminary and Workplan
- B. Progress
- C. Draft and Final

TASK I: DESCRIPTION OF CURRENT CONDITIONS

The Respondent shall submit for U.S. EPA approval, a report providing the background information pertinent to the facility, contamination, and interim measures as set forth below. The data gathered during any previous investigations or inspections and other relevant data shall be included.

A. **Facility Background**

The Respondent's report shall summarize the regional location, pertinent boundary features, general facility physiography, hydrogeology, and historical use of the facility for the treatment, storage or disposal of solid and hazardous waste. The Respondent's report shall include:

1. Map(s) depicting the following:

   a. General geographic location;

   b. Property lines, with the owners of all adjacent property clearly indicated;

   c. Topography and surface drainage (with a contour interval of two (2) feet and a scale of 1 inch = 100 feet) depicting all waterways, wetlands, floodplains, water features, drainage patterns, and surface water containment areas;

   d. All tanks, buildings, utilities, paved areas, easements, rights-of-way, and other features;

   e. All solid or hazardous waste treatment, storage or disposal areas active after November 19, 1980;

   f. All known past solid or hazardous waste treatment, storage or disposal areas regardless of whether they were active on November 19, 1980;

   g. All known past and present product and waste underground tanks or piping;

   h. Surrounding land uses (residential, commercial, agricultural, recreational); and

   i. The location of all production and ground water monitoring wells. These wells shall be clearly labeled and ground elevations and top of casing elevations and construction details included (these elevations and details may be included as an attachment).

All maps shall be consistent with the requirements set forth in 40 CFR § 270.14 and be of sufficient detail and accuracy to locate and report all current and future work performed at the site.

2. A history and description of ownership and operation, solid and hazardous waste generation, treatment, storage and disposal activities at the facility;

3. Approximate dates or periods of past product and waste spills, identification of the materials spilled, the amount spilled, the location where spilled, and a description of the response actions conducted (local, state, or federal response units or private parties), including any inspection reports or technical reports generated as a result of the response; and

4. A summary of past permits requested and/or received, any enforcement actions and their subsequent responses, and a list of documents and studies prepared for the facility.

B. **Nature and Extent of Contamination**

The Respondent shall prepare and submit for U.S. EPA approval, a preliminary report describing the existing information on the nature and extent of contamination.

1. The Respondent's report shall summarize all possible source areas of contamination. This, at a minimum, should include all regulated units, solid waste management units, spill areas, and other suspected source areas of contamination. For each area, the Respondent shall identify the following:

   a. Location of unit/area (which shall be depicted on a facility map);

   b. Quantities of solid and hazardous wastes;

   c. Hazardous waste or constituents, to the extent known; and

   d. Identification of areas where additional information is necessary.

2. The Respondent shall prepare an assessment and description of the existing degree and extent of contamination. This should include:

a. Available monitoring data and qualitative information on locations and levels of contamination at the facility;

b. All potential migration pathways including information on geology, petrology, hydrogeology, physiography, hydrology, water quality, meteorology, and air quality; and

c. The potential impact(s) on human health and the environment, including demography, ground water and surface water use, and land use.

C. **Implementation of Interim Measures**

The Respondent's report shall document interim measures which were or are being undertaken at the facility. This shall include:

1. Objectives of the interim measures: how the measure is mitigating a potential threat to human health and the environment and/or is consistent with and integrated into any long term solution at the facility;

2. Design, construction, operation, and maintenance requirements;

3. Schedules for design, construction and monitoring; and

4. Schedule for progress reports.

TASK II: PRE-INVESTIGATION EVALUATION OF CORRECTIVE MEASURE TECHNOLOGIES

Prior to starting the facility investigation, the Respondent shall submit to EPA a report that identifies the potential corrective measure technologies that may be used on-site or off-site for the containment, treatment, remediation, and/or disposal of contamination. This report shall also identify any field data that needs to be collected in the facility investigation to facilitate the evaluation and selection of the final corrective measure or measures (e.g., compatibility of waste and construction materials, information to evaluate effectiveness, treatability of wastes, etc.).

TASK III: RFI WORKPLAN REQUIREMENTS

The Respondent shall prepare a RCRA Facility Investigation (RFI) Workplan. This RFI Workplan shall include the development of several plans which shall be prepared concurrently. During the RCRA Facility Investigation, it may be necessary to revise the RFI Workplan to increase or decrease the detail of information collected to accommodate the facility specific situation. The RFI Workplan includes the following:

A. **Project Management Plan**

The Respondent shall prepare a Project Management Plan which will include a discussion of the technical approach, schedules, budget, and personnel. The Project Management Plan will also include a description of the qualifications of personnel performing or directing the RFI, including contractor personnel. This plan shall also document the overall management approach to the RCRA Facility Investigation.

B. **Data Collection Quality Assurance Plan**

The Respondent shall prepare a plan to document all monitoring procedures: sampling, field measurements, and sample analysis performed during the investigation to characterize the environmental setting, source, and contamination, so as to ensure that all information, data and resulting decisions are technically sound, statistically valid, and properly documented.

1. Data Collection Strategy

The strategy section of the Data Collection Quality Assurance Plan shall include but not be limited to the following:

a. Description of the intended uses for the data, and the necessary level of precision and accuracy for these intended uses;

b. Description of methods and procedures to be used to assess the precision, accuracy, and completeness of the measurement data;

c. Description of the rationale used to assure that the data accurately and precisely represent a characteristic of a population, parameter variations at a sampling point, a process condition, or an environmental condition. Examples of factors which shall be considered and discussed include:

i) Environmental conditions at the time of sampling;

ii) Number of sampling points;

iii) Representativeness of selected media; and

iv) Representativeness of selected analytical parameters.

d. Description of the measures to be taken to assure that the following data sets can be compared to each other:

i) RFI data generated by the Respondent over some time period;

ii) RFI data generated by an outside laboratory or consultant versus data generated by the Respondent;

iii) Data generated by separate consultants or laboratories; and

iv) Data generated by an outside consultant or laboratory over some time period.

e. Details relating to the schedule and information to be provided in quality assurance reports. The reports should include but not be limited to:

i) Periodic assessment of measurement data accuracy, precision,and completeness;

ii) Results of performance audits;

iii) Results of system audits;

iv) Significant quality assurance problems and recommended solutions; and

v) Resolutions of previously stated problems.

2. Sampling

The Sampling section of the Data Collection Quality Assurance Plan shall discuss:

a. Selecting appropriate sampling locations, depths, etc.;

b. Providing a statistically sufficient number of sampling sites;

c. Measuring all necessary ancillary data;

d. Determining conditions under which sampling should be conducted;

e. Determining which media are to be sampled (e.g., ground water, air, soil, sediment, etc.);

f. Determining which parameters are to be measured and where;

g. Selecting the frequency of sampling and length of sampling period;

h. Selecting the types of sample (e.g., composites vs. grabs) and number of samples to be collected;

i. Measures to be taken to prevent contamination of the sampling equipment and cross contamination between sampling points;

j. Documenting field sampling operations and procedures, including;

i) Documentation of procedures for preparation of reagents or supplies which become an integral part of the sample (e.g.,filters, and adsorbing reagents);

ii) Procedures and forms for recording the exact location and specific considerations associated with sample acquisition;

iii) Documentation of specific sample preservation method;

iv) Calibration of field devices;

v) Collection of replicate samples;

vi) Submission of field-biased blanks, where appropriate;

vii) Potential interferences present at the facility;

viii) Construction materials and techniques, associated with monitoring wells and piezometers;

ix) Field equipment listing and sample containers;

x) Sampling order; and

xi) Decontamination procedures.

k. Selecting appropriate sample containers;

l. Sample preservation; and

m. Chain-of-custody, including:

i) Standardized field tracking reporting forms to establish sample custody in the field prior to and during shipment; and

ii) Pre-prepared sample labels containing all information necessary for effective sample tracking.

3. Field Measurements

The Field Measurements section of the Data Collection Quality Assurance Plan shall discuss:

a. Selecting appropriate field measurement locations, depths, etc.;

b. Providing a statistically sufficient number of field measurements;

c. Measuring all necessary ancillary data;

d. Determining conditions under which field measurements should be conducted;

e. Determining which media are to be addressed by appropriate field measurements (e.g., ground water, air, soil, sediment, etc.);

f. Determining which parameters are to be measured and where;

g. Selecting the frequency of field measurement and length of field measurements period; and

h. Documenting field measurement operations and procedures, including:

i) Procedures and forms for recording raw data and the exact location, time, and facility-specific considerations associated with the data acquisition;

ii) Calibration of field devices;

iii) Collection of replicate measurements;

iv) Submission of field-biased blanks, where appropriate;

v) Potential interferences present at the facility;

vi) Construction materials and techniques associated with monitoring wells and piezometers used to collect field data;

vii) Field equipment listing;

viii) Order in which field measurements were made; and

ix) Decontamination procedures.

4. Sample Analysis

The Sample Analysis section of the Data Collection Quality Assurance Plan shall specify the following:

a. Chain-of-custody procedures, including:

i) Identification of a responsible party to act as sample custodian at the laboratory facility authorized to sign for incoming field samples, obtain documents of shipment, and verify the data entered onto the sample custody records;

ii) Provision for a laboratory sample custody log consisting of serially numbered standard lab-tracking report sheets; and

iii) Specification of laboratory sample custody procedures for sample handling, storage, and dispersement for analysis.

b. Sample storage procedures and storage times;

c. Sample preparation methods;

d. Analytical procedures, including:

i) Scope and application of the procedure;

ii) Sample matrix;

iii) Potential interferences;

iv) Precision and accuracy of the methodology; and

v) Method detection limits.

e. Calibration procedures and frequency;

f. Data reduction, validation and reporting;

g. Internal quality control checks, laboratory performance and systems audits and frequency, including:

i) Method blank(s);

ii) Laboratory control sample(s);

iii) Calibration check sample(s);

iv) Replicate sample(s);

v) Matrix-spiked sample(s);

vi) "Blind" quality control sample(s);

vii) Control charts;

viii) Surrogate samples;

ix) Zero and span gases; and

x) Reagent quality control checks.

h. Preventive maintenance procedures and schedules;

i. Corrective action (for laboratory problems); and

j. Turnaround time.

C. **Data Management Plan**

The Respondent shall develop and initiate a Data Management Plan to document and track investigation data and results. This plan shall identify and set up data documentation materials and procedures, project file requirements, and project-related progress reporting procedures and documents. The plan shall also provide the format to be used to present the raw data and conclusions of the investigation.

1. Data Record

The data record shall include the following:

a. Unique sample or field measurement code;

b. Sampling or field measurement location and sample or measurement type;

c. Sampling or field measurement raw data;

d. Laboratory analysis ID number;

e. Property or component measured; and

f. Result of analysis (e.g., concentration).

2. Tabular Displays

The following data shall be presented in tabular displays:

a. Unsorted (raw) data;

b. Results for each medium, or for each constituent monitored;

c. Data reduction for statistical analysis;

d. Sorting of data by potential stratification factors (e.g., location, soil layer, topography); and

e. Summary data.

3. Graphical Displays

The following data shall be presented in graphical formats (e.g., bar graphs, line graphs, area or plan maps, isopleth plots, cross-sectional plots or transects, three dimensional graphs, etc.):

a. Display sampling location and sampling grid;

b. Indicate boundaries of sampling area, and areas where more data are required;

c. Display levels of contamination at each sampling location;

d. Display geographical extent of contamination;

e. Display contamination levels, averages, and maxima;

f. Illustrate changes in concentration in relation to distance from the source, time, depth or other parameters; and

g. Indicate features affecting intramedia transport and show potential receptors.

D. **Health and Safety Plan**

The Respondent shall prepare a facility Health and Safety Plan.

1. Major elements of the Health and Safety Plan shall include:

a. Facility description, including availability of resources such as roads, water supply, electricity and telephone service;

b. Describe the known hazards and evaluate the risks associated with the incident and with each activity conducted;

c. List key personnel and alternates responsible for site safety, response operations, and for protection of public health;

d. Delineate work areas;

e. Describe levels of protection to be worn by personnel in work areas;

f. Establish procedures to control site access;

g. Describe decontamination procedures for personnel and equipment;

h. Establish site emergency procedures;

i. Address emergency medical care for injuries and toxicological problems;

j. Describe requirements for an environmental surveillance program;

k. Specify any routine and special training required for responders; and

l. Establish procedures for protecting workers from weather-related problems.

2. The Facility Health and Safety Plan shall be consistent with:

a. NIOSH Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities (1985);

b. EPA Order 1440.1 - Respiratory Protection;

c. EPA Order 1440.3 - Health and Safety Requirements for Employees engaged in Field Activities;

d. Facility Contingency Plan;

e. EPA Standard Operating Safety Guide (1984);

f. OSHA regulations particularly in 29 CFR §§ 1910 and 1926;

g. State, local, and other federal agency (e.g., DOD, DOE) regulations; and

h. Other EPA guidance as provided.

E. **Community Relations Plan**

The Respondent shall prepare a plan, for the dissemination of information to the public regarding investigation activities and results.

TASK IV: FACILITY INVESTIGATION

The Respondent shall conduct those investigations necessary to: characterize the facility (Environmental Setting); define the source (Source Characterization); define the degree and extent of contamination (Contamination Characterization); and identify actual or potential receptors (Potential Receptors).

The investigations should result in data of adequate technical quality to support the development and evaluation of the corrective measure alternative or alternatives during the Corrective Measures Study, if one is determined to be necessary.

The site investigation activities shall follow the plans set forth in Task III. All sampling and analyses shall be conducted in accordance with the Data Collection Quality Assurance Plan. All sampling locations shall be documented in a log and identified on a detailed site map.

A. **Environmental Setting**

The Respondent shall collect information to supplement and verify existing information on the environmental setting at the facility. The Respondent shall characterize the following:

1. Hydrogeology

The Respondent shall conduct a program to evaluate hydrogeologic conditions at the facility. This program shall provide the following information:

a. A description of the regional and facility specific geologic and hydrogeologic characteristics affecting ground water flow beneath the facility, including:

i) Regional and facility specific stratigraphy: description of strata including strike and dip, identification of stratigraphic contacts;

ii) Structural geology: description of local and regional structural features (e.g., folding, faulting, tilting, jointing, etc.);

iii) Depositional history;

iv) Identification and characterization of areas and amounts of recharge and discharge;

v) Regional and facility specific ground water flow patterns; and

vi) Characterize seasonal variations in the ground water flow regime.

b. An analysis of any topographic features that might influence the ground water flow system. (Note: Stereographic analysis of aerial photographs may aid in this analysis.)

c. Based on field data, test, and cores, a representative and accurate classification and description of the hydrogeologic units which may be part of the migration pathways at the facility (i.e., the aquifers and any intervening saturated and unsaturated units), including:

i) Hydraulic conductivity and porosity (total and effective);

ii) Lithology, grain size, sorting, degree of cementation;

iii) An interpretation of hydraulic interconnections between saturated zones; and

iv) The attenuation capacity and mechanisms of the natural earth materials (e.g., ion exchange capacity, organic carbon content, mineral content etc.).

d. Based on field studies and cores, structural geology, and hydrogeologic cross sections showing the extent (depth, thickness, lateral extent) of hydrogeologic units which may be part of the migration pathways identifying:

i) Sand and gravel deposits in unconsolidated deposits;

ii) Zones of fracturing or channeling in consolidated or unconsolidated deposits;

iii) Zones of higher permeability or lower permeability that might direct and restrict the flow of contaminants;

iv) The uppermost aquifer: geologic formation, group of formations, or part of a formation capable of yielding a significant amount of ground water to wells or springs; and

v) Water-bearing zones above the first confining layer that may serve as a pathway for contaminant migration including perched zones of saturation.

e. Based on data obtained from ground water monitoring wells and piezometers installed upgradient and downgradient of the potential contaminant source, a representative description of water level or fluid pressure monitoring including:

i) Water-level contour and/or potentiometric maps;

ii) Hydrologic cross sections showing vertical gradients;

iii) The flow system, including the vertical and horizontal components of flow; and

iv) Any temporal changes in hydraulic gradients, for example, due to tidal or seasonal influences.

f. A description of manmade influences that may affect the hydrogeology of the site, identifying:

i) Active and inactive local water-supply and production wells with an approximate schedule of pumping; and

ii) Manmade hydraulic structures (pipelines, french drains, ditches, unlined ponds, septic tanks, NPDES outfalls, retention areas, etc.).

2. Soils

The Respondent shall conduct a program to characterize the soil and rock units above the water table in the vicinity of the contaminant release(s). Such characterization shall include but not be limited to, the following information:

a. SCS soil classification;

b. Surface soil distribution;

c. Soil profile, including ASTM classification of soils;

d. Transects of soil stratigraphy;

e. Hydraulic conductivity (saturated and unsaturated);

f. Relative permeability;

g. Bulk density;

h. Porosity;

i. Soil sorptive capacity;

j. Cation exchange capacity (CEC);

k. Soil organic content;

l. Soil pH;

m. Particle size distribution;

n. Depth of water table;

o. Moisture content;

p. Effect of stratification on unsaturated flow;

q. Infiltration

r. Evapotranspiration;

s. Storage capacity;

t. Vertical flow rate; and

u. Mineral content.

3. Surface Water and Sediment

The Respondent shall conduct a program to characterize the surface water bodies in the vicinity of the facility. Such characterization shall include, but not be limited to, the following activities and information:

a. Description of the temporal and permanent surface water bodies including:

i) For lakes and estuaries: location, elevation, surface area, inflow, outflow, depth, temperature stratification, and volume;

ii) For impoundments: location, elevation, surface area, depth, volume, freeboard, and purpose of impoundment;

iii) For streams, ditches, drains, swamps and channels: location, elevation, flow, velocity, depth, width, seasonal fluctuations, and flooding tendencies (i.e., 100 year event);

iv) Drainage patterns; and

v) Evapotranspiration.

b. Description of the chemistry of the natural surface water and sediments. This includes determining the pH, total dissolved solids, total suspended solids, biological oxygen demand, alkalinity, conductivity, dissolved oxygen profiles, nutrients (NH_3, NO_3^-/NO_2^-, PO_4^{-3}), chemical oxygen demand, total organic carbon, specific contaminant concentrations, etc.

c. Description of sediment characteristics including:

i) Deposition area;

ii) Thickness profile; and

iii) Physical and chemical parameters (e.g., grain size, density, organic carbon content, ion exchange capacity, pH, etc.)

4. Air

The Respondent shall provide information characterizing the climate in the vicinity of the facility. Such information shall include, but not be limited to:

a. A description of the following parameters:

i) Annual and monthly rainfall averages;

ii) Monthly temperature averages and extremes;

iii) Wind speed and direction;

iv) Relative humidity/dew point;

v) Atmospheric pressure;

vi) Evaporation data;
vii) Development of inversions; and

viii) Climate extremes that have been known to occur in the vicinity of the facility, including frequency of occurrence.

b. A description of topographic and manmade features which affect air flow and emission patterns, including:

i) Ridges, hills or mountain areas;

ii) Canyons or valleys;

iii) Surface water bodies (e.g., rivers, lakes, bays, etc.);

iv) Wind breaks and forests; and

v) Buildings.

B. **Source Characterization**

The Respondent shall collect analytical data to completely characterize the wastes and the areas where wastes have been placed, collected, or removed, including: type; quantity; physical form; disposition (containment or nature of deposits); and facility characteristics affecting release (e.g., facility security, and engineered barriers). This shall include quantification of the following specific characteristics at each source area:

1. Unit/Disposal Area characteristics:

a. Location of unit/disposal area;

b. Type of unit/disposal area;

c. Design features;

d. Operating practices (past and present);

e. Period of operation;

f. Age of unit/disposal area;

g. General physical conditions; and

h. Method used to close the unit/disposal area.

2. Waste Characteristics:

a. Type of waste placed in the unit;

i) Hazardous classification (e.g., flammable, reactive, corrosive, oxidizing, or reducing agent);

ii) Quantity; and

iii) Chemical composition.

b. Physical and chemical characteristics;

i) Physical form (solid, liquid, gas);

ii) Physical description (e.g., powder, oily sludge);

iii) Temperature;

iv) pH;

v) General chemical class (e.g., acid, base, solvent);

vi) Molecular weight;

vii) Density;

viii) Boiling point;

ix) Viscosity;

x) Solubility in water;

xi) Cohesiveness of the waste;

xii) Vapor pressure.

xiii) Flash point

c. Migration and dispersal characteristics of the waste;

i) Sorption;

ii) Biodegradability, bioconcentration, biotransformation;

iii) Photodegradation rates;

iv) Hydrolysis rates; and

v) Chemical transformations.

The Respondent shall document the procedures used in making the above determinations.

C. **Contamination Characterization**

The Respondent shall collect analytical data on ground water, soils, surface water, sediment, and subsurface gas contamination in the vicinity of the facility. This data shall be sufficient to define the extent, origin, direction, and rate of movement of contaminant plumes. Data shall include time and location of sampling, media sampled, concentrations found, conditions during sampling, and the identity of the individuals performing the sampling and analysis. The Respondent shall address the following types of contamination at the facility:

1. Ground Water Contamination

The Respondent shall conduct a Ground Water Investigation to characterize any plumes of contamination at the facility. This investigation shall, at a minimum, provide the following information:

a. A description of the horizontal and vertical extent of any immiscible or dissolved plume(s) originating from the facility;

b. The horizontal and vertical direction of contamination movement;

c. The velocity of contaminant movement;

d. The horizontal and vertical concentration profiles of Appendix IX constituents in the plume(s);

e. An evaluation of factors influencing the plume movement; and

f. An extrapolation of future contaminant movement.

The Respondent shall document the procedures used in making the above determinations (e.g., well design, well construction, geophysics, modeling, etc.).

2. Soil Contamination

The Respondent shall conduct an investigation to characterize the contamination of the soil and rock units above the water table in the vicinity of the contaminant release. The investigation shall include the following information:

a. A description of the vertical and horizontal extent of contamination.

b. A description of contaminant and soil chemical properties within the contaminant source area and plume. This includes contaminant solubility, speciation, adsorption, leachability, exchange capacity, biodegradability, hydrolysis, photolysis, oxidation, and other factors that might affect contaminant migration and transformation.

c. Specific contaminant concentrations.

d. The velocity and direction of contaminant movement.

e. An extrapolation of future contaminant movement.

The Respondent shall document the procedures used in making the above determinations.

3. Surface Water and Sediment Contamination

The Respondent shall conduct a surface water investigation to characterize contamination in surface water bodies resulting from contaminant releases at the facility. The investigation shall include, but not be limited to, the following information:

a. A description of the horizontal and vertical extent of any immiscible or dissolved plume(s) originating from the facility, and the extent of contamination in underlying sediments;

b. The horizontal and vertical direction of contaminant movement;

c. The contaminant velocity;

d. An evaluation of the physical, biological and chemical factors influencing contaminant movement;

e. An extrapolation of future contaminant movement; and

f. A description of the chemistry of the contaminated surface waters and sediments. This includes determining the pH, total dissolved solids, specific contaminant concentrations, etc.;

The Respondent shall document the procedures used in making the above determinations.

4. Air Contamination

The Respondent shall conduct an investigation to characterize the particulate and gaseous contaminants released into the atmosphere. This investigation shall provide the following information:

a. A description of the horizontal and vertical direction and velocity of contaminant movement;

b. The rate and amount of the release; and

c. The chemical and physical composition of the contaminants(s) released, including horizontal and vertical concentration profiles. The Respondent shall document the procedures used in making the above determinations.

5. Subsurface Gas Contamination

The Respondent shall conduct an investigation to characterize subsurface gases emitted from buried hazardous waste and hazardous constituents in the ground water. This investigation shall include the following information:

a. A description of the horizontal and vertical extent of subsurface gas mitigation;

b. The chemical composition of the gases being emitted;

c. The rate, amount, and density of the gases being emitted; and

d. Horizontal and vertical concentration profiles of the subsurface gases emitted.

The Respondent shall document the procedures used in making the above determinations.

D. **Potential Receptors**

The Respondent shall collect data describing the human populations and environmental systems that are susceptible to contaminant exposure from the facility. Chemical analysis of biological samples may be needed. Data on observable effects in ecosystems may also be obtained. The following characteristics shall be identified:

1. Local uses and possible future uses of ground water:

   a. Type of use (e.g., drinking water source: municipal or residential, agricultural, domestic/non-potable, and industrial); and

   b. Location of ground water users including wells and discharge areas.

2. Local uses and possible future uses of surface waters draining the facility:

   a. Domestic and municipal (e.g., potable and lawn/garden watering);

   b. Recreational (e.g., swimming, fishing);

   c. Agricultural;

   d. Industrial; and

   e. Environmental (e.g., fish and wildlife propagation).

3. Human use of or access to the facility and adjacent lands, including but not limited to:

   a. Recreation;

   b. Hunting;

   c. Residential;

   d. Commercial;

   e. Zoning; and

f. Relationship between population locations and prevailing wind direction.

4. A description of the biota in surface water bodies on, adjacent to, or affected by the facility.

5. A description of the ecology overlying and adjacent to the facility.

6. A demographic profile of the people who use or have access to the facility and adjacent land, including, but not limited to: age, sex, and sensitive subgroups.

7. A description of any endangered or threatened species near the facility.

TASK V: INVESTIGATION ANALYSIS

The Respondent shall prepare an analysis and summary of all facility investigations and their results. The objective of this task shall be to ensure that the investigation data are sufficient in quality (e.g., quality assurance procedures have been followed) and quantity to describe the nature and extent of contamination, potential threat to human health and/or the environment, and to support the Corrective Measures Study, if one is determined to be necessary.

A. **Data Analysis**

The Respondent shall analyze all facility investigation data outlined in Task IV and prepare a report on the type and extent of contamination at the facility including sources and migration pathways. The report shall describe the extent of contamination (qualitative/quantitative) in relation to background levels indicative for the area.

B. **Protection Standards**

1. Ground Water Protection Standards

For regulated units, the Respondent shall provide information to support the Agency's selection/ development of Ground Water Protection Standards for all of the Appendix IX constituents found in the ground water during the Facility Investigation (Task IV).

a. The Ground Water Protection Standards shall consist of:

i) for any constituents listed in Table 1 of 40 CFR § 264.94, the respective value given in that table (MCL) if the background level of the constituent is below the value given in Table 1; or

ii) the background level of that constituent in the ground water; or

iii) a U.S. EPA approved Alternate Concentration Limit (ACL).

b. Information to support the Agency's subsequent selection of Alternate Concentration Limits (ACLs) shall be developed by the Respondent in accordance with U.S. EPA guidance. For any proposed ACLs, the Respondent shall include a justification based upon the criteria set forth in 40 CFR § 264.94(b).

c. After receipt and review of any proposed ACLs, the U.S. EPA shall notify the Respondent in writing of approval, disapproval or modifications. The U.S. EPA shall specify, in writing, the reason(s) for any disapproval or modification.

d. Within sixty (60) days of receipt of the U.S. EPA's notification or disapproval of any proposed ACL, the Respondent shall withdraw the application or amend and submit revisions to the U.S. EPA.

2. For all other units or areas of contamination, the Respondent shall propose a ground water protection standard for each Appendix IX constituent found in the ground water and provide adequate information to support this proposal, including a justification based upon the criteria set forth in 40 CFR § 264.94(b)..

a. The proposed ground water protection standard will be reviewed by EPA in accordance with U.S. EPA guidance for ACLs.

b. After receipt and review of any proposed ground water protection standards, the U.S. EPA shall notify the Respondent in writing of approval, disapproval or modifications. The U.S. EPA shall specify in writing the reason(s) for any disapproval or modification.

c. Within sixty (60) days of receipt of the U.S. EPA's notification or disapproval of any proposed ACL, the Respondent shall withdraw the proposal or amend and submit revisions to the U.S. EPA.

3. Other Relevant Protection Standards

The Respondent shall identify all relevant and applicable standards for the protection of human health and the environment (e.g., National Ambient Air Quality Standards, Federally-approved State water quality standards, etc.).

C. Respondent may propose that no further action is required upon completion of the RFI and its conclusion that levels of contamination (i.e., hazardous constituents), which are representative of the SWMU or AOC, do not exceed the appropriate action levels proposed by CPC. Respondent shall provide supporting documentation and references for the specific action levels.

Respondent's proposal is subject to EPA review and approval.

TASK VI: LABORATORY AND BENCH-SCALE STUDIES

The Respondent shall conduct laboratory and/or bench scale studies to determine the applicability of a corrective measure technology or technologies to facility conditions. The Respondent shall analyze the technologies, based on literature review, vendor contracts, and past experience to determine the testing requirements.

The Respondent shall develop a testing plan identifying the types(s) and goal(s) of the study(ies), the level of effort needed, and the procedures to be used for data management and interpretation.

Upon completion of the testing, the Respondent shall evaluate the testing results to assess the technology or technologies with respect to the site-specific questions identified in the test plan.

The Respondent shall prepare a report summarizing the testing program and its results, both positive and negative.

TASK VII: REPORTS

A. **Preliminary and Workplan**

The Respondent shall submit to the EPA reports on Tasks I and II when it submits the RCRA Facility Investigation (RFI) Workplan (Task III).

B. **Progress**

The Respondent shall at a minimum provide the EPA with signed, quarterly progress reports containing:

1. A description and estimate of the percentage of the RFI completed;

2. Summaries of all findings;

3. Summaries of all changes made in the RFI during the reporting period;

4. Summaries of all contacts with representative of the local community, public interest groups or State government during the reporting period;

5. Summaries of all problems or potential problems encountered during the reporting period;

6. Actions being taken to rectify problems;

7. Changes in personnel during the reporting period;

8. Projected work for the next reporting date

C. **Draft and Final**

Upon completion by Respondent of Tasks IV and V, and receipt of EPA approval, the Respondent shall prepare a RFI Report and a RFI Summary Report to present the results of Tasks IV and V. The RFI Report and RFI Summary Report shall be developed in draft form for EPA review. The RFI Report shall be developed in final format incorporating EPA's comments, if any, on the Draft RCRA Facility Investigation Report. The results of Task VI, if deemed to be required, shall be submitted as a separate report in accordance with the approved schedule. The schedule for submitting Task VI results or justification that Task VI is not needed shall be submitted with the draft RFI Report.

A summary of the information reporting requirements contained in the RCRA Facility Investigation Scope of Work is presented below:

[NOTE: Due dates are calculated from the effective date of this Order, unless otherwise specified.]

Facility Submission	**Due Date**
Description of Current Situation (Summary of Task I)	Concurrent w/ RFI Workplan
Pre-Investigation Evaluation of Corrective Measure Technologies (Task II)	Concurrent w/ RFI Workplan
RFI Workplan	180 calendar days
Draft RFI Report (Tasks IV and V)	In accordance with approved schedule in RFI Workplan
Final RFI Report (Tasks IV and V)	Due date established in EPA comment letter on Draft RFI Report
Laboratory and Bench-Scale Studies (Results of Task VI)	
° Propose schedule for submittal of Task VI results or justification that Task VI is not needed	Concurrent with submittal of draft RFI Report
° If Task VI is needed: Task VI results	In accordance with approved schedule
Progress Reports on Tasks I through VI	14 calendar days after end of quarter, with first quarter being from January to end of March

ATTACHMENT III

SCOPE OF WORK FOR CORRECTIVE MEASURES STUDY

CORRECTIVE MEASURE STUDY

Task I: Identification and Development of the Corrective Measure Alternative or Alternatives

Task II: Evaluation of the Corrective Measure Alternative or Alternatives

Task III: Justification and Recommendation of the Corrective Measure or Measures

Task IV: Reports

SCOPE OF WORK FOR A CORRECTIVE MEASURE STUDY

PURPOSE

The purpose of this Corrective Measure Study (CMS) is to develop and evaluate the corrective action alternative or alternatives and to recommend the corrective measure or measures to be taken at the Boricua Wood Processing, Inc. Facility. The Respondent will furnish the personnel, materials, and services necessary to prepare the corrective measure study, except as otherwise specified.

SCOPE

The Corrective Measure Study consists of four tasks:

Task I: Identification and Development of the Corrective Measure Alternative or Alternatives
- A. Description of Current Situation
- B. Establishment of Corrective Action Objectives
- C. Screening of Corrective Measures Technologies
- D. Identification of the Corrective Measure Alternative or Alternatives

Task II: Evaluation of the Corrective Measure Alternative or Alternatives
- A. Technical/Environmental/Human Health/Institutional
- B. Cost Estimate

Task III: Justification and Recommendation of the Corrective Measure or Measures
- A. Technical
- B. Environmental
- C. Human Health

Task IV: Reports
- A. Progress
- B. Draft
- C. Final
- D. Schedule

TASK I: IDENTIFICATION AND DEVELOPMENT OF THE CORRECTIVE ACTION ALTERNATIVE OR ALTERNATIVES

Based on the results of the RCRA Facility Investigation and consideration of the identified Preliminary Corrective Measure Technologies (Task II), the Respondent shall identify, screen, and develop the alternative or alternatives for removal, containment, treatment, and/or other remediation of the contamination based on the objectives established for the corrective action.

A. Description of Current Situation

The Respondent shall submit an update to the information describing the current situation at the Facility and the known nature and extent of the contamination as documented by the RCRA Facility Investigation Report. The Respondent shall provide an update to information presented in Task I of the RFI to the Agency regarding previous response activities and any interim measures which have or are being implemented at the Facility. The Respondent shall also make a Facility-specific statement of the purpose for the response, based on the results of the RCRA Facility Investigation. The statement of purpose should identify the actual or potential exposure pathways that should be addressed by corrective measures.

B. Establishment of Corrective Action Objectives

After consultation with Respondent, EPA will establish site specific objectives for the corrective action. These objectives shall be based on public health and environmental criteria, information gathered during the RCRA Facility Investigation, EPA guidance, and the requirements of any applicable Federal statutes. At a minimum, all corrective actions concerning groundwater releases from regulated units must be consistent with, and as stringent as, those required under 40 CFR § 264.100.

C. Screening of Corrective Measure Technologies

The Respondent shall review the results of the RCRA Facility Investigation and reassess the technologies specified in Task II and identify additional technologies which are applicable at the Facility. The Respondent shall screen the preliminary corrective measure technologies identified in Task II of the RCRA Facility Investigation and any supplemental technologies to eliminate those that may prove infeasible to implement, that rely on technologies unlikely to perform satisfactorily or reliably, or that do not achieve the corrective measure objective within a reasonable

time period. This screening process focuses on eliminating those technologies which have severe limitations for a given set of waste and site-specific conditions. The screening step may also eliminate technologies based on inherent technology limitations. Site, waste, and technology characteristics which are used to screen inapplicable technologies are described in more detail below:

1. Site Characteristics

   Site data should be reviewed to identify conditions that may limit or promote the use of certain technologies. Technologies whose use is clearly precluded by site characteristics should be eliminated from further consideration;

2. Waste Characteristics

   Identification of waste characteristics that limit the effectiveness or feasibility of technologies is an important part of the screening process. Technologies clearly limited by these waste characteristics should be eliminated from consideration. Waste characteristics particularly affect the feasibility of in-situ methods, direct treatment methods, and land disposal (on/off-site); and

3. Technology Limitations

   During the screening process, the level of technology development, performance record, and inherent construction, operation, and maintenance problems should be identified for each technology considered. Technologies that are unreliable, perform poorly, or are not fully demonstrated may be eliminated in the screening process. For example, certain treatment methods have been developed to a point where they can be implemented in the field without extensive technology transfer or development.

D. **Identification of the Corrective Measure Alternative or Alternatives**

The Respondent shall develop the Corrective measure alternative or alternatives based on the corrective action objectives and analysis of Preliminary Corrective Measure Technologies, as presented in Task II of the RCRA Facility investigation and as supplemented following the preparation of the RFI Report. The Respondent shall rely on engineering practice to determine which of the previously identified technologies appear most suitable for the site.

Technologies can be combined to form the overall corrective action alternative or alternatives. The alternative or alternatives developed should represent a workable number of option(s) that each appear to adequately address all site problems and corrective action objectives. Each alternative may consist of an individual technology or a combination of technologies. The Respondent shall document the reasons for excluding technologies, identified in Task II, as supplemented in the development of the alternative or alternatives.

TASK II: EVALUATION OF THE CORRECTIVE MEASURE ALTERNATIVE OR ALTERNATIVES

The Respondent shall describe each corrective measure alternative that passes through the Initial Screening in Task VIII and evaluate each corrective measure alternative and its components. The evaluation shall be based on technical, environmental, human health, and institutional concerns. The Respondent shall also develop cost estimates of each corrective measure.

A. Technical/Environmental/Human Health/Institutional

The Respondent shall provide a description of each corrective measure alternative which includes, but is not limited to, the following: preliminary process flow sheets; preliminary sizing and type of construction for buildings and structures; and rough quantities of utilities required. The Respondent shall evaluate each alternative in the four following areas:

1. Technical

The Respondent shall evaluate each corrective measure alternative based on performance, reliability, implementability and safety.

a. The Respondent shall evaluate performance based on the effectiveness and useful life of the corrective measure:

i) Effectiveness shall be evaluated in terms of the ability to perform intended functions, such as containment, diversion, removal, destruction, or treatment. The effectiveness of each corrective measure shall be determined either through design specifications or by performance evaluation. Any specific waste or site characteristics which could potentially impede effectiveness

shall be considered. The evaluation should also consider the effectiveness of combinations of technologies; and

ii) Useful life is defined as the length of time the level of effectiveness can be maintained. Most corrective measure technologies, with the exception of destruction, deteriorate with time. Often, deterioration can be slowed through proper system operation and maintenance, but the technology eventually may require replacement. Each corrective measure shall be evaluated in terms of the projected service lives of its component technologies. Resource availability in the future life of the technology, as well as appropriateness of the technologies, must be considered in estimating the useful life of the project.

b. The Respondent shall provide information on the reliability of each corrective measure including its operation and maintenance requirements and its demonstrated reliability:

i) Operation and maintenance requirements include the frequency and complexity of necessary operation and maintenance. Technologies requiring frequent or complex operation and maintenance activities should be regarded as less reliable than technologies requiring little or straightforward operation and maintenance. The availability of labor and materials to meet these requirements shall also be considered; and

ii) Demonstrated and expected reliability is a way of measuring the risk and effect of failure. The Respondent should evaluate whether the technologies have been used effectively under analogous conditions; whether the combination of technologies have been used together effectively; whether failure of any one technology has an immediate impact on receptors; and whether the corrective measure has the flexibility to deal with uncontrollable changes at the site.

c. The Respondent shall describe the implementability of each corrective measure including the relative ease of installation (constructability) and the time required to achieve a given level of response:

i) Constructability is determined by conditions both internal and external to the Facility conditions and include such items as location of underground utilities, depth to water table, heterogeneity of subsurface materials, and location of the Facility (i.e., remote location vs. a congested urban area). The Respondent shall evaluate what measures can be taken to facilitate construction under these conditions. External factors which affect implementation include the need for special permits or agreements, equipment availability, and the location of suitable off-site treatment or disposal facilities; and

ii) Time has two components that shall be addressed: the time it takes to implement a corrective measure and the time it takes to actually see beneficial results. Beneficial results are defined as the reduction of contaminants to some acceptable, pre-established level.

d. The Respondent shall evaluate each corrective measure alternative with regard to safety. This evaluation shall include threats to the safety of nearby communities and environments as well as those to workers during implementation. Factors to consider are fire, explosion, and exposure to hazardous substances.

2. Environmental

The Respondent shall perform an Environmental Assessment for each alternative. The Environmental Assessment shall focus on the Facility conditions and pathways of contamination actually addressed by each alternative. The Environmental Assessment for each alternative will include, at a minimum, an evaluation of: the short and long term beneficial and adverse effects of the response alternative; any adverse effects on environmentally sensitive areas; and an analysis of measures to mitigate adverse effects.

3. Human Health

The Respondent shall assess each alternative in terms of the extent to which it mitigates short and long term potential exposure to any residual contamination and protects human health both during and after implementation the corrective measure. The assessment will describe the levels and characterizations of contaminants on-site, potential exposure routes, and potentially affected populations. Each alternative will be evaluated to determine the level of exposure to contaminants and the reduction over time. For management of mitigation measures, the relative reduction of impact will be determined by comparing residual levels of each alternative with existing criteria, standards, or guidelines acceptable to EPA.

4. Institutional.

The Respondent shall assess relevant institutional needs for each alternative. Specifically, the effects of Federal, State and local environmental and public health standards, regulations, guidance, advisories, ordinances, or community relations on the design, operation, and timing of each alternative.

B. **Cost Estimate**

The Respondent shall develop an estimate of the cost of each corrective measure alternative (and for each phase or segment of the alternative). The cost estimate shall include both capital and operation and maintenance costs.

1. Capital costs consist of direct (construction) and indirect (non-construction and overhead) costs.

   a. Direct capital costs include:

      i) Construction costs: Costs of materials, labor (including fringe benefits and worker's compensation), and equipment required to install the corrective measure.

      ii) Equipment costs: Costs of treatment, containment, disposal, and/or service equipment necessary to implement the action; these materials remain until the corrective action is complete;

iii) Land and site-development costs: Expenses associated with purchase of land and development of existing property; and

iv) Buildings and services costs: Costs of process and non-process buildings, utility connections, purchased services, and disposal costs.

b. Indirect capital costs include:

i) Engineering expenses: Costs of administration, design, construction supervision, drafting, and testing of corrective measure alternatives;

ii) Legal fees and license or permit costs: Administrative and technical costs necessary to obtain licenses and permits for installation and operation;

iii) Start-up and shakedown costs: Costs incurred during corrective measure start-up; and

iv) Contingency allowances: Funds to cover costs resulting from unforeseen circumstances, such as adverse weather conditions, strikes, and inadequate Facility characterization.

2. Operation and maintenance costs are post-construction costs necessary to ensure continued effectiveness of a corrective measure. The Respondent shall consider the following operation and maintenance cost components:

a. Operating labor costs: Wages, salaries, training, overhead, and fringe benefits associated with the labor needed for post-construction operations;

b. Maintenance materials and labor costs: Costs for labor, parts, and other resources required for routine maintenance of facilities and equipment;

c. Auxiliary materials and energy: Costs of such items as chemicals and electricity for treatment plant operations, water and sewer service, and fuel;

d. Purchased services: Sampling costs, laboratory fees, and professional fees for which the need can be predicted;

e. Disposal and treatment costs: Costs of transporting, treating, and disposing of waste materials, such as treatment plant residues, generated during operations;

f. Administrative costs: Costs associated with administration of corrective measure operation and maintenance not included under other categories;

g. Insurance, taxes, and licensing costs: Costs of such items as liability and sudden accidental insurance; real estate taxes on purchased land or rights-of-way; licensing fees for certain technologies; and permit renewal and reporting costs;

h. Maintenance reserve and contingency funds: Annual payments into escrow funds to cover (1) costs of anticipated replacement or rebuilding of equipment and (2) any large unanticipated operation and maintenance costs; and

i. Other costs: Items that do not fit any of the above categories.

TASK III: JUSTIFICATION AND RECOMMENDATION OF THE CORRECTIVE MEASURE OR MEASURES

The Respondent shall justify and recommend a corrective measure alternative using technical, human health, and environmental criteria. This recommendation shall include summary tables which allow the alternative or alternatives to be understood easily. Tradeoffs among health risks, environmental effects, and other pertinent factors shall be highlighted. The U.S. EPA will select the corrective measure alternative or alternatives to be implemented based on the results of Tasks IX and X. At a minimum, the following criteria will be used to justify the final corrective measure or measures.

A. **Technical**

1. Performance - corrective measure or measures which are most effective at performing their intended functions and maintaining the performance over extended periods of time will be given preference;

2. Reliability - corrective measure or measures which do not require frequent or complex operation and maintenance activities and that have proven effective under waste and Facility conditions similar to those anticipated will be given preference;

3. Implementability - corrective measure or measures which can be constructed and operated to reduce levels of contamination to attain or exceed applicable standards in the shortest period of time will be preferred; and

4. Safety - corrective measure or measures which pose the least threat to the safety of nearby residents and environments as well as workers during implementation will be preferred.

B. **Human Health**

The corrective measure or measures must comply with existing U.S. EPA criteria, standards, or guidelines for the protection of human health. Corrective measures which provide the minimum level of exposure to contaminants and the maximum reduction in exposure with time are preferred.

C. **Environmental**

The corrective measure or measures posing the least adverse impact (or greatest improvement) over the shortest period of time on the environment will be favored.

TASK IV: REPORTS

The Respondent shall prepare a Corrective Measure Study Report presenting the results of Task I through IV and recommending a corrective measure alternative.

A. **Progress Reports**

The Respondent shall, at a minimum, provide the U.S. EPA with signed, quarterly progress reports containing:

1. A description and estimate of the percentage of the CMS completed;

2. Summaries of all findings;

3. Summaries of all changes made in the CMS during the reporting period;

4. Summaries of all contacts with representatives of the local community, public interest groups or State government during the reporting period;

5. Summaries of all problems or potential problems encountered during the reporting period;

6. Actions being taken to rectify problems;

7. Changes in personnel during reporting period;

8. Projected work for the next reporting period; and

9. Copies of daily reports, inspection reports, laboratory/monitoring data, etc.

B. **Draft Corrective Measures Study Report**

The Report shall at a minimum include:

1. A description of the Facility;

   a. Site topographic map & preliminary layouts.

2. A summary of the corrective measure or measures;

   a. Description of the corrective measure or measures and rationale for selection;

   b. Performance expectations;

c. Preliminary design criteria and rationale;

d. General operation and maintenance requirements; and

e. Long term monitoring requirements.

3. A summary of the RCRA Facility Investigation and impact on the selected corrective measure or measures;

a. Field studies (groundwater, surface water, soil, air); and

b. Laboratory studies (bench scale, pick scale).

4. Design and Implementation Precautions;

a. Special technical problems;

b. Additional engineering data required;

c. Permits and regulatory requirements;

d. Access, easements, right-of-way;

e. Health and safety requirements; and

f. Community relations activities.

5. Cost Estimates and Schedules;

a. Capital cost estimate;

b. Operation and maintenance cost estimate; and

c. Project schedule (design, construction, operation).

C. **Final Corrective Measures Study Report**

The Respondent shall finalize the Corrective Measure Study Report incorporating comments received from EPA on the Draft Corrective Measure Study Report.

D. **Schedule**

Facility Submission	Due Date
Draft CMS Workplan	60 calendar days after acceptance of RFI Final Report
Final CMS Workplan	30 calendar days after EPA comments on Draft Workplan
Draft CMS Report	60 calendar days from completion of CMS.
Final CMS Report	30 calendar days after Public and EPA comments on Draft CMS Report
Progress Reports on Tasks I, II, & III	14 calendar days after end of quarter with first quarter being from January to end of March.